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Bulletin of the Atomic Scientists

JUNE 1947

HAROLD C. UREY
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AUSTIN M. BRUES
With the Atomic Bomb Casualty Commission in Japan

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HARRISON BROWN
The World Government Movement in the United States

THE SENATE DEBATES Mr. Lilienthal's Confirmation

BOOKS . . . . . **UN Atomic Energy News**

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A Statement

EMERGENCY COMMITTEE OF ATOMIC SCIENTISTS

These few facts are accepted by all scientists:

1 Atomic bombs can now be made cheaply and in large numbers. They will become more destructive.

2 There is no military defense against atomic bombs, and none is to be expected.

3 Other nations can rediscover our secret processes by themselves.

4 Preparedness against atomic war is futile and, if attempted, will ruin the structure of our social order.

5 If war breaks out, atomic bombs will be used, and they will surely destroy our civilization.

6 There is no solution to this problem except international control of atomic energy and, ultimately, the elimination of war.

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EDITORIAL

LET'S HAVE CLEAR THINKING

If there is something we cannot afford in dealing with atomic energy, it is muddled thinking, policy based on ignorance, hearsay, prejudice, partisan expediency or wishful thinking. The justification for the intrusion of scientists into national and international affairs, is the compelling necessity for a factual, realistic attitude as a basis of political decisions of our statesmen and political thinking of our citizens.

The slogan "let's keep the secret of the atomic bomb", for example, is as unrealistic—and therefore dangerous—as the counter-slogan "let's destroy American bombs". The first proposition is meaningless because there is no such thing as *the* secret of the atomic bomb; the suggestion acquires a definite—and then very limited—meaning only if it is specified what kind of scientific or technical information is meant to be kept secret.

The second proposition (as well as its reversal "let's go on making and storing bombs"), also is based on a dangerous delusion, because preparedness for atomic war depends but very slightly on the stock of assembled bombs, and almost entirely on the quantity of accumulated atomic explosives and, to a lesser extent, on the know-how of bomb construction, two factors left untouched by the proposed (or refused), "destruction" of the bombs.

MIX-UP ON THE RIGHT

The confusion and ignorance still prevailing in some high places are well illustrated by the statements made by Senator Taft in the debate on Lilienthal's confirmation. As documented by quotations from the Congressional Record elsewhere in this issue, Mr. Taft actually became an advocate of Gromyko, while thinking that he was defending Baruch—because in his prejudiced picture the Soviet Union simply *had* to favor the more "radical" and "internationalist" proposals.

It is a reason for satisfaction that many conservative politicians and industrialists have discarded their prejudices against government monopoly on a national and international scale—and espoused first the McMahon Bill, and then the Lilienthal-Baruch plan, realizing that it offered the only alternative to an armament race and the ultimate calamity of atomic war.

The statements by Senators Hickenlooper and Vandenberg, also reported in this issue, and the testimony of industrialists such as Mr. Harry A. Winne of General Electric and Mr. Charles Thomas of Monsanto, are examples of such an enlightened attitude.

Too many of our conservatives, however, applaud the "Baruch plan" only because they noticed that the Soviet Union is violently opposed to it. Otherwise how could one explain the fact that many a Senator has praised Baruch as a patriot, while denouncing Lilienthal as an internationalist, apparently ignorant of the fact that Baruch's plan is merely an elaboration of the Acheson-Lilienthal report, and is, if anything, slightly more internationalistic than the latter. It would be ridiculous—if the subject were not so serious—to see nationalists denounce the sacrifice of American sovereignty, implied in the submission of our atomic research and industry to an international authority, and praise, rather than doubly damn, the same proposal coupled with a second sacrifice of sovereignty—renunciation of the veto.

CONFUSION ON THE LEFT

The confusion is by no means confined to the right. When international control of atomic energy was first suggested—at the time when the official program was that

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of "keeping the bomb a sacred trust"—this proposal naturally found most ready acceptance in liberal and radical circles. True, even at this early stage an attempt was made to substitute for the meaningful notion of international control, the meaningless slogan "let's give the bomb to the United Nations". However, the "phony" character of this slogan was so obvious that it was soon discarded. The adherence of the Soviet Union to the Truman-Atlee-King declaration and the prolonged silence of Moscow on plans of international control, has encouraged wishful thinking by those who saw the Soviet Union as a protagonist of international collaboration frustrated by the imperialists of Britain and the U.S.A. They took it for granted that the Acheson-Lilienthal blueprint cannot but meet with wholehearted approval of the U.S.S.R. (In this, they were of one opinion with Senator Taft.)

Since then, the Soviet Union has revealed itself as the main obstacle in the way of cooperative international development of atomic energy—an attitude which could easily be anticipated from the general Soviet distrust of "entanglements" with capitalist economy.

This has brought confusion into the minds of many "liberals". The A.D.A., which was so obviously a "good thing" before, became suspect, if not evil, after Mr. Gromyko's denounciation of it as a "cartel."

A BLUEPRINT FOR WORLD-WIDE COOPERATION

Mr. Wallace has called for a "global New Deal." The Lilienthal-Baruch plan is the first concrete proposal for a global New Deal put before the nations of the world—a blueprint for world-wide cooperation in the development of atomic energy for the benefit of all mankind, with American science, manpower, technology and money offered generously for fostering the development of atomic energy everywhere in the world. For Wallace and those who claim adherence to his principles, this plan should be a bright star in the dark skies of world affairs; its full support should be their first article of faith.

But has not the Lilienthal plan been adulterated by Mr. Baruch with his intransigeant insistence on the abolition of the veto? So say many "liberals", who base their attitude on second-hand slogans and not on factual knowledge. Here again, they share confusion with Senator Taft. They, too, seem unaware that the Soviet Union opposes the principle of international ownership and management of atomic energy plants even more strenuously than it does a change in the veto rule.

True, Wallace and Baruch had a much-publicized row about the American plan. But it dealt only with two incidentals: the veto, and the time schedule. In the second point, Wallace admitted that he was mistaken and that the American proposal is to give the UN the right to devise a complete step-by-step program. And, as to the veto, Wallace's criticism (with which we agree) was that it was irrelevant to the main purposes of the plan and should not be pressed if it makes Russian acceptance more difficult. Wallace argued against all that may stand in the way of realization of the Lilienthal-Baruch plan, and by no means against its fundamentals.

But what about Mr. Wallace's followers?

A "Science Conference" called by the Progressive Citizens of America, met in Chicago on April 12. Atomic energy was an item on their agenda. But instead of an enthusiastic endorsement of the plan for international control, the draft resolution merely called for general Russian-American rapprochement. The preamble stated with regret that a grave disagreement has developed between the U.S. and the U.S.S.R. atomic energy plans, and gave the following explanation: "U.S.S.R. refuses to give up its right for peacetime development of atomic energy." The words missing in this motivation—which make all the difference—are "development of atomic energy without control by any international body." While some American conservatives are for the international control of atomic energy merely because the U.S.S.R. is against it, certain American "liberals" are lukewarm to it for the same reason.

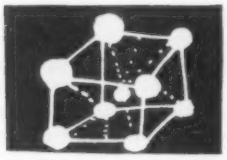
ALL LIBERALS SHOULD STAND FAST ON INTERNATIONAL CONTROL

We believe that Mr. Wallace, despite his tendency to seek justification for all policies of the Soviet Union, is an independent man deeply convinced of the necessity of broad cooperation with the Soviet Union to avoid the catastrophe of war. We also believe that Americans who look to him for leadership believe in the same principles, and that only a few of them are "fellow travelers" for whom every word from Moscow is a message of unquestionable truth. Mr. Wallace and his followers bear a heavy responsibility. The program of international control of atomic energy could not succeed as a partisan program of the liberal left; it cannot succeed as an exclusive program of the conservative right. It has only a fighting chance to prevail with the support of the whole American people.

To achieve security and survival of America, the more enlightened of our conservatives and capitalists are prepared to sacrifice their belief in the supreme virtue of private enterprise and national sovereignty. The Soviet Union must be persuaded to sacrifice, in the well-understood interest of her own security and survival, her belief in the supreme virtue of socialistic isolationism in the capitalist world. Both sides must take risks—the alternative being an almost complete certainty of a catastrophe for both of them. Mr. Wallace and his friends should use whatever influence they have with the Soviet leaders to persuade them that the Lilienthal-Baruch plan is not a clever scheme for capitalist domination of the Soviet economy. Affirmation—or rather re-affirmation—of support for the international management of atomic energy, as the first concrete step towards world cooperation for security and prosperity by those whom *Pravda* recently listed as the "friends of the Soviet Union" would be the best contribution to world peace that Mr. Wallace and his friends could make at the present time.

E.R.

AN ALTERNATIVE COURSE FOR THE CONTROL OF ATOMIC ENERGY



Harold C. Urey

None saw more quickly than the scientists that atomic energy would demand new techniques of political control. No one has followed the discussion of these techniques with greater concern of mind and heart than Dr. Urey who now discusses not the ideal, but the practical, solution. Dr. Urey, a Nobel Prize Winner and a recently elected member of the Royal Society of London, is Distinguished Service Professor of Chemistry and a member of the Institute for Nuclear Studies at the University of Chicago.

In the latter part of 1945 the Atomic Scientists stated publicly and vigorously that there was no satisfactory solution to the problem of the atomic bomb except world control of atomic energy in all its phases. They brought this view to the attention of the people of the United States and to our government leaders in Washington, and they have done all they can to bring this point of view to the attention of people in other countries. Their efforts were highly successful, and largely due to them, a very unusual and enlightened proposal for the control of atomic energy was placed before the Atomic Energy Commission of the United Nations in the form of the Baruch proposals, which were to a large extent the proposals of the Acheson-Lilienthal Committee.

It seems to me that these proposals were very generous. I have no doubt that there were groups of people in the United States who were insincere in their support of these proposals, hoping that some advantage over the Soviet Union would result from them. I am sure also that there are groups with quite different sympathies who saw in them a way of supporting the ambitions of the Soviet Union. But I believe that our own government officials and the citizens of our country as a whole hoped for a good and constructive solution of the atomic bomb problem, and ultimately of the great problem of war, through these proposals. They were presented to the United Nations last June by Mr. Baruch; almost immediately support for them was secured from eight nations represented on the Atomic Energy Commission, and almost as promptly it became clear that no cooperation along this line was to be secured from the U.S.S.R. and Poland.

The situation remains substantially the same today. A careful reading of the whole proceedings of the Atomic Energy Commission from last June to the present leads me to believe that no progress along lines acceptable to this country has been secured. I think we should conclude that none is possible in the immediate future.

AN EXPERIMENT HAS FAILED

As scientists we have engaged in an experiment in international political control of the atomic bomb, and today it seems to me that we should realize that that experiment is a failure. That is my conclusion, and it has been my conclusion for some time. Moreover, I believe the time is growing short and that alternative proposals and actions should be undertaken at once.

There are people who believe that serious errors in the negotiations have been made. There are those who believe that the raising of the veto question was a mistake. It is my belief, however, that no modification of the negotiations would have made any substantial change in the results. Nations do not make their decisions or international affairs primarily because somebody speaks in a soft or an angry tone of voice, but because they believe that their vital national interests are at stake.

Many speculations can be made as to the reasons for the stand of the U.S.S.R. and its satelite Poland on this problem. None of us really knows what the reasons are, but I offer my own personal guesses. Probably the U.S.S.R. could not admit free inspection of the Soviet Union. Such inspectors would probably learn that the Soviet Union is very weak from a military standpoint, and hence the possibility of Russia's continuing its immense bluff in the international poker game would be destroyed. Moreover, inspectors would probably learn that there are large numbers of political prisoners in Russia, perhaps as many as the reported 14 million, living in the prison camps. This would produce a very unfavorable reaction in the western democracies if reported by an international inspection service.

INSPECTION WOULD THREATEN RUSSIAN GOVERNMENT

Moreover, the subjects of the Russian dictatorship themselves would learn of the greatly advanced economic and social position of the peoples of the western countries, and hence would become dissatisfied with the experiment of Communism, and hence the Communist dictatorship itself would be threatened. No doubt the leaders of the U.S.S.R. sincerely believe that they can improve the physical well-being of the people of their country by the government and economic structure which they have set up in that country, and hence they wish to maintain this experiment in Communism and will resist its destruction in every way they can. Perhaps the most important objection to the Baruch proposals stems from the belief on the part of the government of the U.S.S.R. that the organization proposed and supported overwhelmingly by the western democracies would result in economic and military domination of the Soviet Union.

These are plausible reasons why the Soviet Union can never admit international inspectors of the kind we believe are necessary. But regardless of whether these suggested reasons are the correct ones or not, it is highly improbable, it seems to me, that the U.S.S.R. will agree to the essentials of the Baruch proposals, and I believe it to be true also that

the United States Senate will accept nothing except what is essentially included in the Baruch proposals. Whatever the reasons, the impasse is complete and probably permanent, for a number of years at least.

ALTERNATIVES MUST BE CONSIDERED

If these conclusions are correct, it is necessary to consider alternatives. Many scientists are saying that we must secure agreement along the lines of the Acheson-Lilienthal plan. I believe this statement is completely incorrect. It is not necessary that we secure any agreement whatsoever. The most probable outcome of atomic bombs and other modern methods of war is that European civilization and its extensions in various parts of the world will be destroyed for many years to come, and that world leadership will pass to other races. It seems to me this is by all odds the most probable outcome. To say that we must secure agreement is like saying that the tides must not rise.

There are others who believe that we should continue negotiations along the present lines because the time has not yet arrived when atomic bombs can be produced by other countries. Again, no one knows just how long it will be until atomic bombs can be produced. I myself have felt that they might be produced within ten years after Hiroshima, or perhaps less. Others believe that it will be at least ten years and probably longer. But we do not know whether it would be possible to convince the U.S.S.R. of the correctness of our propositions within that time or not. Perhaps we could. But while this process of education through negotiation is going on, other groups in the United States and other countries will begin to formulate alternatives; they are likely to secure adherence to those alternatives, and they may not be the most desirable ones. In fact, it would seem that there is an alternative course of action growing in the United States now, consisting of purely military alliances such as existed in Europe before World War I, and at times it seems that this trend may be so powerful that it may be too late to suggest more constructive courses of action. The time limit on securing a solution to the problem is the time that we have before other alternatives are proposed and set irresistibly in motion.

What should be the alternative? I believe that there is no real solution to the atomic bomb problem except the complete solution of the problem of war. This has been stated by a great number of people in high official position and in responsible private positions. If another war comes, atomic bombs are almost certain to be used because of their decisive character, and therefore instead of considering the limited objective of the control of atomic energy, we should consider the solution of the problem of war. There are many causes for war, but there has never been but one cure for war, and that is the setting up, over all the possible warring groups, of a governmental structure such that it can settle by peaceful means the quarrels and disagreements that arise. Thus, it is my conclusion that only world government can prevent war in the future. Even this will not exclude the possibility of serious civil war, but civil wars are less probable than international wars.

UNITED NATIONS NOT A GOVERNMENT

What is world government? The United Nations does not represent a government. It is analogous to the organization of this country under the Articles of Confederation between 1781 and 1789. It has no sovereignty. It has no proper governmental organization. There is no way of making laws or of enforcing them. It has no way of supporting itself except by passing the tin cup to 54 nations. To state what the United Nations is not is to state in a negative way what a world government should be. But in order to be clear, let us repeat this. A world government must have a certain limited sovereignty, and in this region of activities it makes the final decision from which there is no appeal. Then it must have some properly constituted organization that can make laws, an executive body that can enforce them, and courts that can make decisions when laws are violated. It must have taxation to support itself, for he who pays the piper calls the tune. Moreover, a government must have direct access to its citizens, i.e., it must make laws for its citizens, and enforce them directly upon its citizens. This relationship was discussed in this country in 1787, and its effectiveness has been demonstrated by the success of our own federal government, as well as of others, since that time.

The Baruch proposals, if they had been carried through and had been further studied and expanded, would have constituted a limited world government. The proposals included the assignment of a very limited sovereignty to the Atomic Development Authority. This Authority would have had the power of making laws or regulations, and considerable executive powers. Very soon it would have been necessary for it to set up courts of some kind to adjudicate violations of these regulations, and in some way or other it would have been necessary for it to finance itself.

None of these difficulties have been discussed because the negotiations have never proceeded beyond the initial stage. Moreover, the Baruch proposals would necessarily have led on to the extension of these proposals to other weapons of war, for the inspection or policing power could not have closed its eyes to other preparations for war besides atomic bombs. But this proposed limited government was badly constituted. It was supposed to have a limited sovereignty but to report to the United Nations, which has none. In many ways the Atomic Development Authority was much like the Tennessee Valley Authority. I think that some phases of this proposal stemmed from our experience with that authority, but whereas the TVA reported to a very stable government, the ADA would have reported to a weak league of states.

SENTIMENT FOR WORLD GOVERNMENT TESTED

In spite of many misgivings in regard to the Baruch proposals, I supported the proposals throughout the negotiations in the United Nations, because I believed that they might grow into a properly constructed organization if sincere cooperation could be secured, and because I believed that it was a test of the sentiments of the world as to the possibility of a world government. If the countries of the world would approach the Ba-

ruch proposals in a constructive fashion, then it would be my conclusion that probably they would also approach the idea of world government in a constructive fashion. And if they should refuse any free and constructive approach to the Baruch proposals, then it seems that they would also refuse to approach the problem of world government in a constructive and cooperative fashion.

It always seemed to me that there was as high a probability, or perhaps higher, of securing agreement on a basis of a broad solution to the whole problem of world government as through the proposal of a very limited and weekly organized world government such as the ADA. If countries were disposed to view the world government problem constructively, it was very easy for them to make the proposal that we proceed to a general solution through world government. The U.S.S.R. and Poland made no such suggestions, and therefore I believe that a world government including Russia and her satellites, as well as the western democracies, is not possible. Temporarily, at least, an all-embracing world government cannot be secured.

A CALL FOR FEDERAL UNION NOW

It is therefore necessary to consider limited alternatives. As matters stand, the world is divided into two groups, the U.S.S.R. on the one hand and the U.S.A. on the other, together with a considerable number of countries in various parts of the world, but particularly in Western Europe, that are in the tragic position of lying between these two centers of power. If these countries do not react to the bold solutions that we offer, we should always remember that it is entirely understandable that they do not. Their position is determined by a physical situation, and not by anything we may say in regard to that position, and their position is not changed by any actions that we take unless the action is the making of war between these two large centers of power. Anything we do that attempts to avoid such a catastrophe does not damage the position of these countries.

My proposal is that we set up a federal union of as many countries of the world as possible. I believe that a substantial area of agreement exists between the western democracies. Their governmental structures, while disagreeing in details, are in an overwhelming degree similar to each other. We are very proud of our Bill of Rights, but that Bill of Rights is now practised, and has been practised for many years, by many other countries of Western Europe. Even the casual visitor to England, France, the Scandinavian countries, Holland, Belgium, and Switzerland will recognize that such is the case. Freedom of speech, of religion, the right of trial when accused of offenses, are all part of the tradition of these countries. Moreover, their governmental structure consists of parliaments, executive departments, and well-established courts, just as our own does. We may remark that these are all in marked contrast to what we find in the totalitarian countries. In addition to a common governmental pattern, there has been marked intellectual association between these countries and our own and other countries distributed around the globe. The differences in language are no barrier. Surely the problems of the United Nations are not due to a language barrier. Translation is easy and can be made rapidly, and the faults of distribution of information do not lie in these fields.

A federal union such as is proposed here should be set up as a true government with a sovereignty limited to certain definite fields—the war departments and foreign offices, and probably also economic transactions between the divisions of the union, though at the present time the most important immediate problem is the question of war. Such a government should also have the power to support itself by taxation, so that it is not dependent upon appropriations from member countries.

EFFECTS OF A WORLD GOVERNMENT

What would be the effects of such a limited world government, in which the word "limited" must be applied to the word "world" as well as to the word "government"? In the first place, it would produce a distinct unbalance of power, with an enormous advantage on the side of the democracies. I am not interested in balance of power, for it inevitably leads to war. I am interested in a distinct unbalance of power, so that the initiative is on our side.

If a federal union included only the British Commonwealth and the United States, for example, there would be an enormous strength in our military and industrial potential. Such a concentration of power on our side would keep the initiative in this terrible game of world politics in our hands, and if our government, in the sense of our federal limited world government, did not follow the lines that we as citizens thought it should, we might be able to influence it in our favor. If, on the other hand, the other side should acquire a dominant world position, we would have no influence on the course of world events. If we had a powerful federal union side by side with another powerful federal union such as the U.S.S.R., then the weaker of the two could hardly attack, and the stronger of the two would not need to, and some years of peace might be secured during which a number of things might happen on the favorable side.

STRENGTHENING OF DEMOCRACY

Another effect of this union would be to strengthen the democratic elements in all the countries of the world. The situation of democratically inclined people of Europe at the present time is tragic. They live in fear for their very lives, for if totalitarianism spreads over Europe they will be exterminated. Hence on the part of each individual person there is a strong tendency to join that party or group which might make his record acceptable when the totalitarian power takes over. A strong democratic power in the world that had in it the possibility of adding other countries to it would strengthen the position of democratically inclined people and give them hope, and thus strengthen the democratic elements in the direction of favorable action toward our union.

Many people fear the spread of totalitarian ideas from Russia to the west. Such a strong union would give the best possible guarantee of forcing the wave of totalitarianism toward the east in Europe. In fact, it is my personal belief that the totalitarian

wave would move eastward immediately if such a strong group were organized. And in the end it might completely change the governmental and social structure of Russia itself in the direction of human freedom.

OBJECTIONS WILL BE RAISED

Objections to this federal union will be raised. One of the first is that Russia would not like the proposal. I admit that she would not, but I do not care much whether she likes it or not if we can keep our own political behavior proper and correct, by which I mean no military attack on Russia. Such an attack would be disastrous to this country, to the peoples of western Europe, and to Russia herself, and cannot be made without losing a very substantial fraction of our individual freedom, and acquiring a very substantial degree of totalitarianism ourselves.

But regardless of whether the U.S.S.R. likes it or not, her actions will remain substantially the same. Countries act not on the basis of their likes and dislikes of what other people do. They act primarily on the basis of what they believe is good for their own peoples within the limitations of what they can do. Russia, even with atomic bombs, would certainly hesitate before she undertook any violent action against such a federal union. She would probably modify her foreign policy to prevent an armed conflict that would be so disastrous to her.

Others object to this proposal because they say it will lead to war by the most direct route. It might; the probability may be better than 50%; but I maintain that any other alternative which seems at all possible at present also has an enormous risk of leading to war. For example, the present policy of the United States government in Greece and Turkey, with its possible extension to other fields, carries with it great probability of eventual war. And if this so-called Truman Doctrine is not followed, and if a policy of do-nothing and vacillation is followed, I think it will in all probability also lead to war. And neither the Truman Doctrine nor the vacillating doctrine has within it any constructive potential whatever.

The proposal made here does have a constructive objective, namely, the establishment of law and order in at least part of the world at once, and with it the possibility of extending law and order over the rest of the world in the future. By merely supporting any sort of government in Greece and Turkey as long as they are against Communism, we arrive at a purely negative solution with no constructive end, so far as I can see. It is such alternatives that will be taken by various groups in this country and abroad that must always be compared with the proposal presented here. It is useless to compare this limited alternative with some idealistic solution which we all would like to have, namely, a broadly democratic world government over the whole surface of the globe, if this ideal solution cannot be secured, as I am convinced it cannot, in time to be useful in the present situation.

A SAFEGUARD TO SECURITY

Other objections to this proposal are made on the ground that we would lose our atomic secrets, and of course our military secrets. I think it is not necessary to argue this point with scientists, for they all realize that our secrets are of a very temporary character and are not as important as a proper, all-embracing idea to which our whole line of action can be tied in a constructive fashion. The secrets of the atomic bomb will be acquired by other people in time in any case. But just to be specific, let us look at the situation as it exists at present. There are people in England, France, Denmark, who know a great deal about our atomic secrets. We have no control over their actions by any legal methods.

My proposal would replace this situation by a much more constructive one. We would not give the atomic secrets to France, to England, to Holland, any more than we give our present secrets to the State of Illinois. There might be citizens of other countries who would know these secrets, but if so, they would be controlled by law just as are the citizens of the State of Illinois at present. We would replace the situation in which we have no legal control over people who know atomic bomb secrets with one in which some sort of control would be set up, and thus, from the standpoint of military secrets, the situation would be improved. Of course, the more people who know atomic energy secrets or other military secrets, the more likely we are to have leaks of such information, but if some loss of information does occur, this would not be as important in a military way as the greatly increased military strength of such a federal union.

Today we are engaged in a contest for human freedom. During the last war we crushed one type of totalitarian tyranny in a military sense, but the ideological fight has not been won, for we cannot eliminate ideas by physical means and yet maintain freedom of thought. Only better and more inspiring ideas can be used to fight tyrannical ideas. The greatly increased physical strength to be secured from the course of action proposed here would make possible the furthering of constructive ideas without the great danger of trying to do so by the imposition of totalitarian control over the thoughts of our own people and the people of other countries.

ONLY VIGILANCE PREVENTS TYRANNY

Many people are afraid that a world government, even of the partial kind proposed here, would become tyrannical. This is a danger that we always face no matter what our government structure may be. It is not particularly encouraging at present to observe the anti-Communist actions that are proposed by the President of the United States under present circumstances. It is easily possible that these anti-Communist actions with respect to members of our federal government will extend within a relatively short time to other groups of citizens. I can even imagine that it would in time include anyone who had subscribed to the New Deal, in spite of the overwhelming majorities that were given to President Roosevelt in four elections. The possibility of tyranny always exists, and there can be no security against this except vigilance. But tyranny will come to all of us as a result of the threat of modern war, and particularly be-

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WITH THE ATOMIC BOMB CASUALTY COMMISSION IN JAPAN

Austin M. Brues

Dr. Brues presents his impressions of the Japanese people, the attitude of Japanese scientists and his observations of the after effects of the bomb. The author spent two months in Japan between November 1946 and January 1947, as a member of the Atomic Bomb Casualty Commission.[1] Dr. Brues is Associate Professor in the Department of Medicine and in the Institute of Radiobiology and Biophysics at the University of Chicago, and Director of the Biology Division at the Argonne National Laboratory.

The purpose of our visit to Japan was to make detailed plans to submit our recommendations for long-range study of atomic bomb casualties. In doing this, it was necessary to gather some technical information, and also to gain such information about the social and scientific situations in Japan as would make it possible to see how the objectives could be accomplished.

The Atomic Bomb Casualty Commission was well supplied with facilities by the occupation so that in the course of seven weeks we were able to visit the bomb fields and several of the Japanese universities and to become well acquainted in Tokyo.

The Eighth Army supplied us with a train of well equipped railroad cars, and the Public Health and Welfare Division gave us whole-hearted cooperation.

In our visits to the atomic fields, we were accompanied by representatives of SCAP and the Japanese Ministry of Welfare, and by Dr. Masao Tsuzuki, who represents the Japanese Research Council and was referred to by Dr. Philip Morrison in an earlier article in the Bulletin of the Atomic Scientists.

The Japanese are said to have the highest standard of living in the Orient, but it is very low according to our standards and also in comparison with that in Japan before the war. Over half of the houses have been destroyed in many communities, and wood for reconstruction is short. Also, many of the best buildings and houses have been offered by the Japanese government for use by the occupation. A man can easily carry his winter's supply of charcoal home from the ration depot in his hands. Where windows have been broken, no glass is available for repair. Many men (including some prominent individuals) wear used Army clothing and canvas shoes. A little gasoline is available, but most Japanese trucks and busses are fitted with charcoal burners which feed inflammable gases to the carburetors.

FOOD IS SCARCE IN JAPAN

Although every available square foot of tillable soil is utilized, food, especially rice, is strictly rationed. It is due in a large measure to the necessity for conserving food that Allied personnel are excluded from Japanese restaurants and hotels. The railroads are tremendously overcrowded with Japanese travelers, most of whom are traveling from the city to the country to get food for their own use, or from the country to the city to sell it on the black market. Domestic animals are extremely rare; a few oxen are used to carry burdens in rural districts. Japanese studies were initiated in Hiroshima on rabbits of the animal colony of the University of Literature and Sciences, about one mile from the hypocenter. Fourteen out of the thirty-two survived and were to be used in breeding experiments, but as a result of poor caging facilities and depredators (possibly human) the colony became depleted. Even fruit fly studies had to be given up for lack of facilities.

There is no gross evidence of malnutrition among the Japanese, but it seems probable that subclinical deficiency states are common. This is suggested by the mild anemias in such control populations as have been observed.

A moderate inflation is under way in Japan. The yen, which was worth about 50 cents before the war, was pegged at 15 to the dollar, with purchases of yen permitted but sale prohibited. It was said that yen could be obtained in many places at the rate of 50 or 60 to the dollar, and recently the official rate was raised to 50. Comparison of prices of various standard articles while we were there suggested that the true equivalence was 75 to 100 yen to the dollar.

As in other occupied countries, American cigarettes are greatly in demand, much more so than food. Consideration of the price of Japanese cigarettes (3 yen each) and frequent rumors indicated that a carton of cigarettes would, if illegally sold, yield 400 to 500 yen.

The Japanese economic situation is epitomized in the hospitals. They are unheated except for one or two charcoal pots burning a few fragments of charcoal in each ward; the limited coal ration is devoted to sterilizing. Many windows are broken and there is no glass for repairs, so that cold air blows through the corridors and down some wards and clinics. Radiators were removed for scrap metal during the war, but are generally left rusting in the hospital yard.

Due to scarcity and rationing of food, no central kitchen facilities are available, so that families of patients bring in their rations and heat them over the charcoal pots, also feeding the patients.

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1. This commission, consisting of Dr. Brues, Dr. Paul S. Henshaw of Oak Ridge, Lts. Melvin Block and James Neel of the Manhattan District, and Lt. Frederick Ullrich of the Naval Medical Research Center, was appointed by the National Research Council at the suggestion of the Surgeon General's office. Since their return, the National Academy of Sciences has established a standing committee on Atomic Casualties to undertake a long-range study of the biological effects of the atomic bomb on man, pursuant to a Presidential directive.

Japanese are polite (but with less elaborate formality, probably, than before the war). They are fatalistic about the war, which is only another of many disasters to which the Japanese are accustomed. Yet they are not stolid, but are a spirited people with a good sense of humor and much intelligence. It is interesting to see the almost universal reaction of men who 18 to 24 months ago were shooting and being shot by Japanese. These men appear to share the recognition of the Japanese character which is also held by those "feather merchants" in the occupation who have observed the Japanese only recently, arriving in the wake of the victors.

Every Japanese must have a master, it is said. During the war, the master was the army, which engineered the war against the better judgment of the navy. The master now is General MacArthur and the SCAP organization, which is attempting to remove itself from this position without leaving a successor or a vacuum. The question of whether the Japanese can govern themselves remains to be seen, and may lie with the coming generation. If they do learn to govern themselves, they will no doubt do it with wisdom, as the lawmakers will probably follow the will of the people with a care not seen anywhere else.

READY FOR DEEPER INFLUENCE

In the past century, western civilization has made a heavy impact on the ancient civilization of Japan. Since the war, Japan is ready for a deeper influence. Where this new social impact will derive from, is not yet known; America is certainly in an excellent position to exert it. No doubt other ideologies are at work; although they are not seen, they must be recognized. We must bear in mind that many of the sincere efforts in Japan are hampered by lack of support and by the manning of Japan by young American soldiers who have hardly learned the significance of their own system beyond the full dinner-pail. More attention should be paid to providing adequate communications for the military government. The occupation of Japan may well turn out to be, although eminently peaceful, one of the decisive battles of the world.

One of the welcome surprises to which we were treated was the attitude of the Japanese scientists. We had held the impression that they would need encouragement to work on the after-effects of the bombs. We soon learned that this would be unnecessary; they already had written 120 papers on various medical aspects of the atomic bomb and (as scientists would be) were more concerned with the possibility of publishing their work than with alleviation of the circumstances under which they had to work.

SCIENTIFIC LEADERS ARE OBJECTIVE

Most of the Japanese scientists, through their contacts with Teutonic science of a few decades ago, have been less exposed to the attitude of free criticism and more inclined to academic authoritarianism than Americans. Under these conditions, it is often those who have studied in this country who stand out as the coming leaders of science in Japan, and everywhere there is a sincere hope and effort to learn our manner of thinking. They are painstaking and objective; their objectivity found its reward in the enthusiasm with which the bomb effects were studied by men whose colleagues and families had been killed in the bombing. One man had even turned the site of his ruined home into a garden plot for the experimental study of bomb effects upon plant growth.

A story told by one of the prominent Japanese physicists was of considerable interest to us. It appears that the Japanese were aware of the nature of the atomic bomb very soon after it was dropped. This was suspected within a few hours and physicists proceeded to the bombed areas where they were able to verify this assumption. One member of the group was asked about two days after the Hiroshima bomb to assemble as many physicists as possible and develop an atomic bomb. He was offered six months in which to accomplish this and replied that he would be unable to carry out such an assignment under existing conditions. Soon after that he was called to Tokyo where the general staff was in session and at two-thirty one afternoon was asked for information about the means of defense against the atomic bomb. He replied that the only defense was to keep all aircraft from flying over Japan. At 5:00 o'clock on the same afternoon the General Staff agreed to surrender.

The scientific observations collected by our commission have been given in a report issued by the National Research Council and released by the War Department. The greater part of the report deals with the medical studies made by the Japanese, and was written by Dr. Tsuzuki. The acute effects of the bomb have been adequately described in earlier releases. These have been termed "atomic bomb injury" which is a syndrome resulting from the combination of thermal, mechanical, and radiation energy. Under the disorganized conditions resulting from the atomic bomb explosion, it is obviously difficult to separate these effects. Out of the picture, however, emerges the pattern of radiation damage in many of the victims, including loss of hair, extreme depression of white blood cells, and an increased bleeding tendency leading to blood loss under the skin and into body cavities.

The survivors of this acute radiation damage later show anemia and sterility. The latter was studied in a group of males, and it was found that recovery occurs. This acute radiation picture serves to verify what is well appreciated from experimental work on the nature of radiation damage.

One observation of the Japanese, that the mortality rate near the bomb center was higher in males than in females, is of interest, but lacks an explanation at the moment.

BURN EFFECTS IN FORM OF KELOIDS

As of the time of our visit, the acute phase of the bomb effects had apparently passed, and there was little to be seen. The only striking and consistent finding was the state of burn effects. Many of the burns healed with accumulations of large amounts of elevated scar tissue, or keloids. These scars continue to grow and become more elevated for eight to ten months, at which time they reach maximum growth.

Keloids present a problem of great interest. They are by no means unknown following various types of injury which heal with scar formation, and it has been noted that they

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A JAPANESE SCIENTIST DESCRIBES THE DESTRUCTION OF HIS CYCLOTRONS

Yoshio Nishina

The following memorandum was made by Dr. Nishina as a contemporary record of the destruction of the cyclotrons in the Institute of Physical and Chemical Research in Tokyo, of which the author is Director. The account was brought back by Dr. Paul S. Henshaw, a member of the Atomic Bomb Casualty Commission, and is published here for the first time.

Dr. Nishina is a well known nuclear physicist who has worked in the United States and in Copenhagen.

Under the date of October 15, 1945, request was filed with the SCAP for the permission to operate the cyclotrons in the Nishina Laboratory for the purpose of research in biology, medicine, chemistry and metallurgy. The permit was immediately granted, but it was later restricted to investigations only in the field of biology and medicine. While we were getting ready for work along the lines authorized, suddenly on November 20, the Laboratory was subjected to investigation by SCAP GHQ, and in the evening of November 22, a memorandum was transmitted through the Central Liaison Office, rescinding the previous authorizations and directing that the research be stopped. On November 24, at 8:30 A.M., Major O'Hearn, GHQ, gave us the order for the destruction of the two cyclotrons in the Laboratory, one weighing 220 tons, and the other 28 tons. The destruction was accomplished in five full days, by Engineers of the 8th Army, working day and night.

In the afternoon of November 24, Nishina went to the Central Liaison Office, reporting the actual condition of the destruction of the cyclotrons, and, accompanied by Mr. Iguchi, Secretariat-General of the Office, presented himself at GHQ, where he met Colonel Rider and Major O'Hearn and inquired as to the reason for the destruction of the cyclotrons. The conversation did not reveal anything beyond that the destruction was by the order from the U. S. Government. Nishina asked specifically whether or not the opinions of American scientists were consulted by the Government concerning the destruction of the cyclotrons. To this question Major O'Hearn answered "Yes, of course," adding that Dr. Compton, who was in Japan recently, is stationed at Washington and his opinion is reflected in the Government action. As will be stated later we found subsequently that this information was incorrect.

CYCLOTRONS CANNOT PRODUCE A BOMB

Even today we absolutely fail to understand the reason for ordering the destruction of the cyclotrons. We surmise that cyclotrons might be considered as indispensable for the study or manufacture of atomic bombs. This, however, we know to be a mere "superstition" of uninformed laymen. A cyclotron may have been an important apparatus in the early studies on the creation of atomic bombs, but now that the atomic bomb has been invented, the manufacture of it no longer needs a cyclotron. It is only necessary to have sufficient uranium to produce any number of atomic bombs without the aid of a cyclotron, and conversely, however many cyclotrons one may have, no atomic bomb can be manufactured without the uranium material. This fact is clearly revealed by the statements of American scientists engaged in the production of atomic bombs.

Now, it is a unified opinion of geologists and mineralogists that Japan does not produce sufficient uranium for the manufacture of an atomic bomb. Even without SCAP directive forbidding it, therefore, there is no possibility of the manufacture of atomic bombs in Japan. It should also be pointed out that the Japanese industrial power, even at the pre-war level, to say nothing of the conditions today, was altogether inadequate for the production of atomic bombs, even if there were enough uranium in Japan. This is an important point which should not be lost sight of in the consideration of the problem.

Our request to SCAP for the authorization to operate the cyclotrons was for the purpose of researches in biology and medicine, aiming at new discoveries which may greatly improve agriculture, forestry, animal husbandry, fishery and medical therapy. This has been the line of thought apparent even before the war, and we expected from such researches no inconsiderable contributions toward the stabilization of national living and improvement of national health in post-war Japan.

It was indeed for this reason that Dr. Compton, Head of the Scientific Intelligence Survey, GHQ, and other scientists associated with him, recommended to GHQ the authorization of the operation of the cyclotrons, and the authorization granted in the first place. That not only this authorization would be rescinded but also the cyclotrons would be destroyed without adequate notice was almost beyond the limits of our credulity.

LARGER CYCLOTRON JUST COMPLETED

The cyclotrons in question were constructed through the tireless efforts of a few scores of scientists for a dozen or more years, and at the cost of no small amount of money. The larger cyclotron was just completed last year (1944). By the sad and untimely destruction, it was robbed of any chance to make contributions to science.

According to articles, however, appearing afterwards in *The Stars and Stripes* and *Time* magazine, the group of American scientists concerned in the manufacture of the atomic bomb at Oak Ridge, Tenn., declared the wrecking of the Japanese cyclotrons was "wanton and stupid to the point of constituting a crime against mankind," and was "as disreputable and ill considered as would be the

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HOW THE AMERICAN PEOPLE FEEL ABOUT THE ATOMIC BOMB

Sylvia Eberhart

Early in 1946 the Committee on the Social Aspects of Atomic Energy, of the Social Science Research Council, proposed a study of "the thinking of the American public on matters relating to the development of the atomic bomb and its effect on attitudes on international relations." A sub-committee was formed for the planning of such a study, and funds were provided through Cornell University by the Carnegie Corporation and the Rockefeller Foundation. This report was prepared by Mrs. Eberhart at the request of Dr. Leonard S. Cottrell, Jr., chairman of the sub-committee.

Not the least of the questions confronting the scientists and public leaders who must cope with the problem of the atomic bomb is, What is the public frame of mind? For better or for worse, the bomb is a political problem, and "public opinion", however measured or guessed at, is a political instrument. Whatever social or political action is taken as a result of the discovery of the bomb will inevitably involve the people generally. What are their attitudes toward the bomb and toward the issues it has raised?

This study was planned so that both polling and intensive methods of surveying public opinion were employed.[1] The impending Naval experiments with the bomb at Bikini seemed to the sub-committee to offer a focal opportunity for appraising public reactions; the surveys were accordingly conducted in two parts, one part in June and the other in August. This article deals almost entirely with the findings of the intensive surveys.

To some it will perhaps be incredible that as many as two percent of the American people should not by last August have heard of the atomic bomb. To the investigator of public opinion the fact that such an event as the release of atomic bombs over Japan came within the ken of 98 percent of the heterogeneous American public is most impressive. In the full report[2] of the survey, public cognizance of the bomb is described thus:

The impact of the atomic bomb on the minds of the American people has had few parallels in our history. All but the most inaccessible few know about the bomb. People who have never heard of the United Nations and have neither interest in nor knowledge of world affairs know that a new and tremendous force has been discovered.

Few people in present-day America venture to depreciate the power of the bomb. While public concepts of the bomb vary from the very simple to the highly sophisticated, they almost universally emphasize its destructiveness. Many people were surprised that the bombs did not destroy more ships at Bikini, but the Bikini tests did not alter the pervading belief that the atomic bomb stands in a class of its own, a weapon of awe-inspiring power.

But has the existence of the bomb aroused fear? Are the people worried by predictions that another war may bring unprecedented devastation into their own country? Are they following with anxious interest the efforts of their leaders to create safeguards against atomic war?

On the whole, it must be concluded from the survey that the threat of the bomb does not greatly preoccupy the people, and that they are not giving special attention to the issues in which it is involved.

PUBLIC AWARENESS OF THE ISSUES OF CONTROL

That a very large part of the American public is not concerned about the issues involving the bomb is strongly indicated by the level of their information about the most prominent of these issues. At the time of the survey, more than a year after the United Nations had come into existence and in spite of the virtually unlimited attention devoted to it up to that time by press and radio, one-third of the people were unable to say what the United Nations was designed to accomplish, in even such general terms as "to work for peace" or "to get the countries of the world to cooperate." These people were scarcely aware, if not totally unaware, of the existence of the organization to which it had been proposed that the control of the bomb should be entrusted.

It is of course possible to separate the opinions and attitudes of obviously uninformed people from those of people who are at least relatively well informed. But to the question, "Cannot the views of the uninformed on public issues, if they have any, be disregarded?" it must be answered that ignorance does not carry with it an automatic disenfranchisement. One-fifth of the people who reported that they had voted in the 1944 national elections were included among those who did not know what the United Nations is.

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1. Polling surveys use questions of the check-list type, to which the person interviewed responds simply by saying "Yes" or "No" or by choosing from a short list of prepared alternatives. Intensive surveys use "free answer" questions which the respondent answers in a conversational manner, these responses being recorded verbatim by the interviewer. Intensive methods of surveying are usually employed when it is desirable to obtain detailed information regarding the reasoning which lies behind opinion, the intensity with which opinions are held, and the explanation of changes or trends in opinion. In the present study, the intensive surveys were intended to simplify and supplement the findings of the polling surveys.

2. *Public Reaction to the Atomic Bomb and World Affairs*, Cornell University, Ithaca, New York, April 1947.

Moreover, many of the people who did have some cognizance of the UN and so were asked to express an opinion about the desirability of giving it control over the bomb did not recognize the meaning of the issue. They were overwhelmingly opposed to the proposal (Table 1), but it was quite clear in their reasoning that most of them understood it to mean giving the bomb secret away to foreign countries. Publicity since then on the debate over the issue may have increased public understanding. But it is plain that as late as last summer public understanding had a long way to go.

It is evident that many people's—probably most people's—thinking about the bomb must stop far short of the issues involving the bomb that actually confront the nation. But virtually the entire adult population of the country can think about the bomb itself, even if not in a way that is oriented toward solving the problems its development has raised. Is their failure to follow the news about control of the bomb a function of the beliefs they hold regarding the bomb itself? Is it due to a sense of security arising from our monopoly of the bomb? Or is it the result of more general attitudes, related not simply to the bomb but to any problem not intimately a part of their personal day-to-day preoccupations? The answer is that it is due in some degree to all these factors, but probably most of all to the last.

UNDERSTANDING OF THE BOMB ITSELF

The conception the people have of the bomb is by no means unambiguous, even though they are greatly impressed by the bomb's destructive power.

When confronted with the direct question "How long do you think it will be before the other countries are able to make the atomic bomb?" (Table 2), at least a quarter of the people felt unable to give any answer. Those who did answer, however, were for the most part agreed that the time would not be very long. Only two in a hundred said that other countries could never make the bomb, and only five in a hundred that it would take them as long as ten years or simply "a long time." Many said it was quite possible that some other country might already be making the bombs; very few felt sure that this was the case, but they spoke of it as a possibility.

The conjectures of experts on the length of time it will take other countries to develop the bomb appear, therefore, to have had a wide hearing. On the question of a defense against the bomb (Table 3), the pessimistic opinions of authorities are not nearly as widely accepted. A third of the people would venture no opinions when asked whether they thought we could develop a defense, a quarter expressed the opinion that "there is no defense against the bomb," but well over a third believed that we would work out a defense before other countries could make the bomb.

No examination of newspaper treatment of the defense question at the time of the survey has been attempted, but it seems likely that the two questions received quite different kinds of treatment in the press and on the radio, for it is significant that even among people who gave evidence of being relatively well informed on world affairs the opinion that we would succeed in developing a defense was very widespread (Table 3a). The reasoning with which people supported this opinion points to an attitude that probably accounts for a good deal of public complacency. The people have immense faith in American science, American ingenuity, and American resources. They argue that since the scientists were able to invent the bomb, they can invent a defense, and that the United States "always keeps ahead."

TABLE I

"Do you think the secret of the bomb should be turned over to the UN, or should the United States try to keep the secret itself?"

	June	August
It should be turned over to UN	10%	6%
It should be turned over to UN under some conditions	3	3
Undecided, don't know	5	3
It should be kept by the United States, except under certain conditions	8	8
It should be kept by the United States	40	41
Believe it is not a secret	2	4
Opinions not ascertained	1	1
Do not know what UN is	30	32
Know neither what the UN is nor what the atom bomb is	1	2
	100%	100%
Number of cases	585	592

Reasons given by those who favored keeping the secret:[3]	
Other countries would use the bomb	32%
It is in good hands here	26
It is a protection for us	18
It was developed in this country	8
Other countries might get the secret from UN	9
UN is not sufficiently strong to control the bomb	7
Miscellaneous reasons	4
No reason given	13
	[4]
Number of cases	474

Reasons given by those who favored turning the secret over to the UN:	
The secret cannot be kept	37%
Giving it to UN would help keep peace in the world	31
It would show faith in UN	21
Atomic energy could then be used for peacetime purposes	10
It would eliminate fear of the United States	5
Other countries already have the secret	4
Otherwise there will be an atomic war	2
Miscellaneous reasons	11
No reason given	10
	[4]
Number of cases	94

3. The findings of June and August are combined, as there were no notable differences in people's reasoning at the different times.

4. Each column adds to more than 100 percent because some people gave more than one reason.

No doubt the deficiencies in people's understanding of the bomb make it easier for them to put the bomb problem out of their minds. But mere reiteration that the development of the bomb is accessible to other countries and that there is no known defense against it will not necessarily jar the public into appreciably greater concern. People can accept such judgments without incorporating them into their attitudes and ways of thinking. For example, a large group of people argued in the survey that the development of the bomb had made peace easier to keep, rather than harder, because other countries were afraid of it and would not dare to provoke a war with us. Many of these same people, in answer to the direct question, declared freely that other countries would probably develop the bomb within a relatively short time. The information they had apparently absorbed had not shifted our monopoly of the bomb from the central position it occupied in their thinking.

This phenomenon—a not uncommon one—of public opinion is even more conspicuous in people's attitude toward our keeping the secret of the bomb rather than relinquishing it to UN control. Most of the people who opposed turning the secret over to the UN had expressed the opinion, just before, that other countries could develop the bomb fairly soon; yet many of them made no acknowledgment of the bearing of that probability on the question of UN control of the bomb.

Moreover, descriptions of the extraordinary power of the bomb, including its inescapability, may offer a kind of psychological refuge. Many people reasoned that the bomb was a contribution to peace because it seemed unthinkable that governments would dare to provoke a war when so terrible a weapon might be used by any side. If the menace is universally inescapable, if retaliation is inevitable, then may we not all be safe? Such reasoning may be more an expression of hope than of conviction, but apparently it plays its part in enabling people to turn their backs on the bomb problem.

TABLE II

"How long do you think it will be before the other countries are able to make the atomic bomb?"

Some other country may already be able to	20%	24%
Before long (no precise statement of time)....	16	13
Less than one year	1	3
One to three years	5	5
Three to five years	6	4
Five to ten years	5	5
Ten years or more	3	3
A long time (no precise statement of time) ...	3	2
No other country will be able to make it	2	2
"It depends" (no definite prediction)	8	8
Don't know	27	26
Opinions not ascertained	3	3
Do not know what atomic bomb is	1	2
	100%	100%

TABLE III

"Do you think we will be able to work out a defense against the bomb before other countries learn how to make it?"

Yes	35%	36%
Yes, with qualifications..	5	4
Undecided, don't know ..	36	29
No, with qualifications..	1	1
No	18	24
Opinions not ascertained	4	4
Do not know what atomic bomb is	1	2
	100%	100%

"I LET THE GOVERNMENT WORRY"

To the question, "How worried do you think people in this country are about the atomic bomb? How about yourself?" half the people said they were not at all worried, many others that they were worried very little. Only a quarter admitted to being worried. The most striking aspect of the explanations people gave for *not* being worried was *how little they were based on the argument that there is no threat to us in the bomb.* Only one "non-worrier" in seven explained his frame of mind in that way—by the statement, for example, that we alone have the bomb, or that the bomb will never be used, that its dangerousness has been exaggerated (a remark made by only about one percent in the survey), that we will have a defense, or that no other country could make the bomb. Another smaller group said they felt personally safe, either because their advanced age made it unlikely that they would live to see another war, or because they lived in places that would never be subjected to attack.

Table IIIa

Answers classified according to respondents' levels of information about world affairs.[5]

	LEVEL OF INFORMATION		
	Low	Medium	High
Yes	29%	41%	38%
Yes, with qualifications	4	5	4
Undecided, don't know	45	29	24
No, with qualifications	[6]	1	1
No	11	21	31
Opinions not ascertained	6	3	2
Do not know what bomb is	5	-	-
	100%	100%	100%
Number of cases	386	392	399

Most of the "non-worriers" acknowledge in their explanations, openly or by implication, that the bomb constitutes a danger, and as a group their answers to the questions about other countries' development of the bomb and our having a defense against it were only a little more optimistic than those of the people who said they were worried. Their reasons for not worrying were for the most part reasons that they might apply to any issue that does not immediately affect them—that "there is no use worrying about something you can't help," that they are too busy with their own affairs to think about any-

5. Here the June and August samples are combined. Levels of information were appraised on the basis of evidences in the interviews of familiarity with names, events, and issues prominent in the news of world affairs. All those in the "low" category were unfamiliar with the UN.

6. Less than one percent.

thing so remote as the atomic bomb, that the bomb represents a problem for the government or the scientists to worry about, not the ordinary citizen. These quotations from interviews are illustrative of the variety of ways in which this attitude is expressed:

I'm not worried. I think that the head officials or whatever it is would know how to use it.

I feel like our government will take care of its own, and there is no need for me to worry about something I have no control over.

I know the bomb can wipe out cities, but I let the government worry about it.

I let the people who are qualified in those things do the worrying. I am just one of the many people who accept circumstances as they are. To me, it is just like if you were living in a country where there were earthquakes. What good would it do you to go to bed every night worrying whether there would be an earthquake?

In a personal sense I'm not worried. Of course I do have the hope that it'll never be used . . . I have the feeling that worried or not it wouldn't make any difference.

I don't think I devote much time to worrying about it. The building business is too complicated now for me to worry about the bomb. It's too remote.

I got everything I need. From the morning, when I get up, I pick apples and I get a dollar a bushel. So why should I worry about the bomb? I don't need to worry. Let it come. I don't think about it.

Here too there were evidences that people may take refuge from worry in the very power of the bomb itself; some professed to find comfort in the belief that "you wouldn't even know it if one hit." Others remarked that "you cannot be killed any deader by an atomic bomb than you can by a bullet or a block-buster."

Such views as these are undoubtedly subject to hasty revision in the face of imminent danger. There can be no doubt of the people's recognition of the terrible power of the bomb, and a threatening incident involving the bomb would certainly cause a strong public reaction. But for most of the people the danger is not on the horizon. Accordingly, the bomb problem suffers the same kind of popular neglect that many another less critical social issue receives.

ATTITUDES TOWARD THE UNITED STATES' ROLE IN WORLD AFFAIRS

It must be recognized that for a sizable proportion of the American public international affairs have very little reality. The psychological imminence of world events varies enormously within the population. Despite the tremendous network of newspapers, radio, magazines, and other educational media, only a minority of the people can be considered actively conversant with contemporary world problems.

For the most part, public opinion regarding the role of the United States in world affairs deals in the broadest generalities. Current public opinion embraces the generalizations that the United States cannot remain aloof from the rest of the world, and that international cooperation is essential for the promotion of peace. The people in the survey overwhelmingly rejected the proposition that "we should keep to ourselves and not have anything to do with the rest of the world." Similarly, they rejected the proposition that "we should use our army and navy to make other countries do what we think they should." Those who had some familiarity with the UN expressed approval of the existence of such an organization, supported the principle that the United States should have no greater voice in it than any of the other large nations, and agreed that it should have the power to settle disputes between the United States and other countries. Many people even accepted the proposal that we should participate in a more extended form of world organization, when it was defined as one in which "we would have to follow the decisions of the majority of nations."

But on specific issues the broad principles they espouse do not serve them as a guide. On specific issues they still tend to think of immediate American interests, in the narrow framework in which they are able to see them. For example, a majority were opposed to the British loan (a current topic at the time of the survey) on the grounds that the British were already too much indebted to us, and that we could not afford to lend them so much money. They were overwhelmingly opposed to our turning the bomb over to the UN, on the grounds that we would thus foolishly jeopardize our own security. It must be emphasized that they did not see in our monopoly of the bomb any suggestion of a hostile policy. They reasoned that so long as we alone have it, not only we but the rest of the world will be safe from atomic warfare, inasmuch as we have no ambitions that would make us the aggressors in a war. That the matter may not appear in this light to the other fellow entered into the thinking of very few, however. In principle they would undoubtedly acknowledge the truism that international cooperation involves willingness to compromise on everyone's part, but the main criticisms they had to offer of our government's conduct in its relations with other countries was that it was "giving in" too much.

Russia is very much in the minds of the people who give any thought to world affairs, and distrust and suspicion of her are very widespread. Most of the people believe that we cannot depend on her to be friendly to us, and their desire to keep the bomb secret, their criticisms of our giving in too much, their dissatisfactions with the progress of the UN are often related to misgivings about Russia. The proportion of people who expressed consistently favorable attitudes toward Russia in the survey was negligible, and evidences of even a tolerant attitude were sparse.

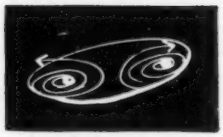
Public acceptance of the idea of international cooperation or international organization must be appraised in the light of all these limitations. How well the people's tendency to look to cooperation with other countries as a promising approach to world peace will withstand the strain of the inevitable international discords is problematic.

A NOTE ABOUT POPULAR SOURCES OF INFORMATION

The survey included a brief investigation of the sources of the people's information about the bomb, as reported by themselves. Eighty-five percent of the people had radios (in

(Continued on Page 168)

WAR DEPARTMENT THINKING ON THE ATOMIC BOMB



Following is the full text of the document "The Effects of the Atomic Bomb on National Security (An Expression of War Department Thinking)," as submitted to Congress and as reprinted in the Army Navy Journal for April 12, 1947. This report, prepared by the Army, was patterned upon a report of Navy Thinking written by Dr. Bernard Brodie of the Institute of International Studies, Yale University, while in the part-time employ of the Legislative Reference Service, Library of Congress. Under the same auspices Dr. Brodie prepared critiques of the Army-Navy Reports. The BULLETIN expects to publish Dr. Brodie's report of Navy Thinking in an early issue.

PART I

Capabilities and Limitations of the Atomic Bomb

In order properly to consider the effects of the atomic bomb on our National Security, it is necessary to discuss briefly the capabilities and limitations of the weapon. The nature of the atomic bomb, involving as it does a great scientific discovery, and the security measures adopted to safeguard its development and employment, have given rise to false claims and false impressions which have hampered its correct evaluation.

The atomic bomb releases energy in three forms: radiant heat (as in other explosions, but much more intense, due to the extremely high temperature and to the size of the characteristic fire-ball), radiation (similar to X-ray or radium effects), and blast or pressure (similar to ordinary explosions but much more severe). The temperature at the center of the explosion is estimated at millions of degrees Centigrade and even at the edges of the characteristic fire-ball it is placed at between 3,000 and 9,000 degrees C. Burns of unprotected skin occur as far as 13,000 feet from an explosion in the air; however, the heat is of only a fraction of a second's duration and even light clothing or the shadow of a building affords considerable protection at some distance from the explosion. The radiation effects are highly penetrating and are lethal for an average distance of 3,000 feet from a point directly under an air-burst such as that occurring at Hiroshima and Nagasaki. They are caused primarily by gamma rays, which are very intense and penetrating X-rays, by released neutrons, and by the radioactive particles which result from the explosion. The lingering effects of radiation are not accurately known as yet. In the case of a high air-burst over ground or water, it appears that the area can be entered within a matter of hours without harmful effects. On the other hand, radioactivity such as resulted from the underwater explosion at Bikini may deny access to an area or an object such as a ship for many months. The blast effects are essentially those of conventional large high explosive weapons, though on a much larger scale. The energy equivalent of an atomic bomb is estimated at 20,000 tons of TNT if the 20,000 tons of TNT were detonated in one charge. If compared to the total equivalent blast damage of a number of smaller charges set off in efficiently dispersed locations, the effectiveness is something of the order of 800 to 900 tons of TNT. The destruction effected at Hiroshima and Nagasaki covered between 3½ and 7 square miles, including the areas of absolute and serious damage.

The atomic bomb is not an all purpose weapon; in fact, it is rather narrowly limited in its employment due to its great destructive power (which is not significantly reducible at present), and its relative high cost as a single weapon. In a restricted sense, it is just another bomb, particularly suited for purposes of destruction of major targets, such as cities, industrial concentrations and major military targets. In a broader and more accurate sense, it is a "decision in a package," providing a means of wiping out large segments of civilization. The casualties at Hiroshima were 70,000-80,000 killed and a like number injured; those at Nagasaki 35,000-40,000 killed and another 35,000-40,000 injured. The bomb itself is of little value without the means to deliver it on a selected target. Any consideration of the atomic bomb, therefore, must take into account the vehicles by which the atomic explosive is delivered. At the present time means of delivery under tactical conditions are limited to long-range heavy bomber type aircraft, or to surreptitious transportation to, placement on, and detonation at a target.

Future developments will likely make possible the employment of atomic explosives by such other means as pilotless aircraft, and as war-heads in guided missiles and torpedoes. It may also make possible the employment of atomic weapons other than explosives. Such weapons might make use of the radioactive effects of particles dispersed by means other than an explosion, thus providing the radiation effects without the accompanying blast and heat effects.

PART II

The Objective and Requirements of Satisfactory International Control

We recognize that satisfactory international control of atomic energy provides the only alternative to a future atomic armament race with attendant world-wide day-to-day fear of atomic attack; therefore, we sup-

port fully the present efforts to establish such international control. We are aware that to be effective a system of international control must include:

a. An international agency with power to control atomic activities.

b. Right of access to, and freedom of movement within the borders of all nations, to insure adequate inspection for violations.

c. Proper safeguards to protect complying states against the actions of any state violating the agreements. In the final analysis such safeguards must include the readiness to impose sanctions, including war, upon the violator. Therefore, before sharing our atomic knowledge with the nations of the world, we shall insist that these three basic elements be accepted in the control system.

We appreciate that the most we can expect from a system of international atomic control is a period of approximately one year in which to prepare for a full-scale atomic attack with significant quantities of bombs after warning has been given of a major violation of international control regulations on the part of one nation or a group of nations; therefore, we must retain indefinitely, in accord with international agreements, our knowledge and industrial capacity to produce atomic weapons. The employment of such other atomic weapons as radioactive particles or materials is not only possible but also might be effected with little or no warning, since such material would be a readily available by-product of atomic power plants, once developed. This possibility demands our continual vigilance and investigation.

PART III

The Importance of Time

At present, to the best of our knowledge, only the U. S. has developed and manufactured atomic bombs. Other nations are making strong efforts to develop this weapon, but our best estimates indicate that it will take any other nation several years successfully to complete one bomb. It is further estimated that unless a new, "short-cut" technique is developed, and this is not foreseen at present, an additional period of several years will be required before the successful nation could produce a significant number of bombs (significant in the sense that they would provide an important military capability). These calculations lead us to two conclusions:

a. For a number of years, perhaps as many as eight to fifteen, only the U.S. will possess atomic bombs in significant quantities.

b. After the period mentioned in a) above, other nations will possess atomic bombs in significant quantities.

These conclusions are reached without considering the possibility of successfully completing satisfactory international control of atomic energy. If international control is achieved, the U.S. will presumably dispose of its bombs upon satisfactory implementation of the other provisions of the agreement which call for proper safeguards and rights of inspection. It is apparent that a period of time will elapse before final disposition of the U.S. stockpile. Five years from the date of agreement on international control is judged a reasonable figure for such a period. At the end of this period all nations would have access to the know-how of making bombs, but no nation would have authority to do so. Another figure of significance is the estimated time required to produce atomic bombs in significant numbers after illegal seizure of facilities by a violator of the international control agreements. This figure is estimated at one year.

Assuming, then, that international control were made operative in the near future we can draw these three conclusions:

a. For a period of about five years only the U.S. will possess atomic bombs in significant quantities.

b. After a period of about five years no nation will possess atomic bombs in significant quantities.

c. After a period of about five years the U.S. and other nations, by openly violating agreements, can produce in approximately one year significant quantities of atomic bombs.

Considering the two sets of conclusions tabulated above, and noting that the security of the U.S. requires that the most disadvantageous possibilities must dictate our minimum measures for security, it is apparent that we must be prepared to meet the threat of: atomic warfare, with one year's notice, at any time after about five years; atomic warfare, without prior notice, after an interim period of several years (estimated variously from eight to fifteen); and "conventional" warfare at any time.

In the discussion to follow, emphasis will be placed on the future period when other antions, as well as U.S., possess significant quantities of atomic bombs. It must be borne in mind, however, that this military atomic age is still an estimated minimum of several years in the future. In the meantime our strategy, tactics, weapons, and political and military requirements, must undergo gradual evolution, in such a manner that we will attain the advantages of accelerated development and acceptance of the new, while simultaneously retaining the full security afforded by the old. Time is an all-important factor in our military posture.

PART IV

The Effect of the Atomic Bomb on our Political Requirements

The total destruction of a nation's resources which has evolved from the development of strategic bombing has been brought to culmination by the atomic bomb. The end of an atomic war may find both victor and vanquished in a state of almost complete ruin. It follows that winning the war may well not be preserving national security. With minor exceptions, the U.S., due principally to its geographic position, has never been threatened with a destructive war fought on its own territory. Even the appearance of strategic bombers and missiles such as the V-2 posed no immediately serious threat for the population and industry of this country during World War II. The development of long range aircraft and guided missiles, however, coupled with the introduction of atomic explosives now makes the U.S. vulnerable to the destructive effects of total war and leaves us in the position of no longer being able to count so heavily on our geographical location for the protection of our homeland.

The "cushion of time," which we have historically enjoyed for the mobilization of our resources, both manpower and industry, is lost. The loss of our "cushion of time" results not from the atomic bomb alone, but also from the means of delivery, the lang range bombers. As time goes on and long range missiles and other

means of delivery are developed, the effectiveness of surprise attack will be reinforced. The present technical capability, however, of making one-way bombing trips from distant portions of the globe to targets in the U.S. proves that the problem is a current one. We are prevented by our form of government and our constitutional processes from launching surprise attacks against potential enemies, but unfortunately the reverse is not true; whereas our Congress has the sole right to declare war and whereas our moral position in the world and the force of our public opinion prevents our leaders from initiating an undeclared war, the same is not true of possible aggressors who, with their totalitarian forms of government and their uninformed or misinformed populaces are able to launch surprise blows against the U.S. This military disadvantage is a sacrifice we inherently make in the interest of our democratic way of life. Our military strategy must take it into account and devise ways and means of decreasing the scale of its disadvantageous effects.

From a political point of view, then, of vital importance to counteract our loss of a cushion of time is a need for allies. We cannot stand alone in the world today, if for no other reason than lack of sufficient strength to do so. Balance of power is still a factor in preventing war, and will remain so until the United Nations' concepts have developed sufficiently to outmode it. The shock of a powerful aggressor, with modern weapons, including the atomic bomb, can be better absorbed by a number of nations than by a single nation. The ability to retaliate promptly, and eventually to overcome the aggressor, likewise is dependent, if success is to be reasonably certain, on bases, resources, and forces dispersed in more than one nation.

EFFECTIVE INTELLIGENCE SERVICE NEEDED

As a means of securing warning of impending attacks, we must have an effective, national intelligence service. We have never had an adequate intelligence service. A world-wide organization such as that employed by some other great powers has never been accepted by the open, democratic character of the American people, nor has it been, heretofore, a requirement for their security. Since we are a nation whose strength is a potential strength, requiring a certain amount of time to put it into action, it now becomes of supreme importance that we are apprised early of the possibility that a foreign power or powers may be plotting our destruction. We are the choice prize of any aggressor, the envy as far as the material things of life go, of every nation on earth. Adequate intelligence cannot wholly make up for the advantage we accord an opponent in giving him the initiative to attack by virtue of governmental structure, but by gaining prior knowledge of his intentions upon which to base increased alertness on our part, we can offset to some degree his favorable position. We must depart from our traditional position of isolation and inattention to the flow of events in other parts of the world. We must realistically indulge in all forms of intelligence procurement necessary to provide us with the best and most up-to-date information on all the activities of foreign nations which bear on their capabilities or desires to wage war against us. Emphasis is particularly required on the collection and processing of information dealing with scientific activities in foreign countries, information which is of value in furthering our own development programs as well as indicating potential enemy capabilities. This new interest in world affairs goes hand-in-hand with our comparatively recent realization of our overall, world-wide responsibilities and interests. Failure of our intelligence agencies in the future, resulting in an "atomic Pearl Harbor," might well cost us our life as a nation.

At home we must strengthen our means of reducing the threat of espionage, sabotage, and subversion. The danger of crippling blows delivered by foreign agents or disaffected elements of the U.S. populace has mounted as atomic explosions have made possible sabotage incidents of far greater magnitude. A single atomic bomb, surreptitiously planted and remotely detonated can effectively destroy a large industrial concentration. The need for instant counter-offensive action underlines the importance that the machinery for effecting prompt retaliation must not be endangered by subversive activity. Subverted personnel in high governmental positions might readily destroy in the early hours after a surprise attack on the U.S. our capacity to avoid defeat by introducing delay in our countermeasures and our mobilization.

TASK OF CIVILIAN DEFENSE

War today is total war. Since a future attack on the U.S. will be an attack on our industry and the communities serving our industry, we must be prepared to reduce to a minimum the damage, casualties, and dislocation resulting from such an attack. The responsibility for carrying out measures of civil defense must be primarily a civilian responsibility, and the measures effected through civilian organization. In time of emergency the military must devote the bulk of its efforts and resources to its primary mission of destroying the enemy's will and capacity to conduct total war against us. The civil defense task, if of such magnitude that the effort to meet it must be carried out on all levels, starting with individual citizens and extending up through municipal, state and federal government agencies. Federal assistance will surely be required in order that local provisions, methods, and equipment are standard so that aid and reinforcement may be furnished from one locality to another as the nature of the attack requires. In the federal government, a close tie between the military and the civil defense organization will have to be established. Total war inherently demands total mobilization which can only be given direction by a federal agency. The National Guard will bear heavy responsibilities, both for maintenance of law and order when attacks have broken down the normal processes, and also for the local defense against enemy attacks such as airborne operations which are likely to be experienced in connection with atomic bombing attacks. Damage control, repair of public utilities, reestablishment of control and communications and resumption of productive activity are primarily the functions of the community itself. Such measures will be the daily tasks of the "every man" in total war. He is in a battle position as truly as the soldier in uniform, and his dependence on discipline,

training, and ability to act in concert with his fellowmen is as vital to the nation as is the soldier's. Provision must be made to accord him this training, to develop this discipline.

PART V

The Effects of the Atomic Bomb on our Military Requirements

The atomic bomb is the successful result of history's greatest example of the cooperative effort of science, industry, and government to produce a weapon of war. The lesson it teaches is the extreme importance of continuing research and development efforts in the interest of National Security. These efforts must have as their objective the development of better offensive weapons, including improved atomic weapons of all types; defensive weapons and defensive measures for protection against present-day weapons and methods of warfare; and the knowledge with which to understand and estimate properly potential enemy capabilities with respect to new weapons and methods. Although present scientific opinion concludes that there is no effective means of defense against atomic weapons, as distinct from the carriers of such weapons, basic research may result in knowledge leading to measures which afford at least partial protection against or reduction of the effects of these weapons. Our future security may depend to a considerable degree on the successful pursuit of scientific endeavor in this direction. It is conceivable, of course, that defensive means may be developed against the aircraft and other carriers of atomic weapons which would greatly reduce the effectiveness of such carriers and hence of the atomic weapons themselves.

Our own research and development leading to the production of the bomb has taught us that it is possible for a nation to adapt scientific and industrial progress to warfare in such a manner as to affect decisively the outcome. Our military requirements now include as an item of prime importance a coordinated effort, civilian and military, designed to insure that the U.S. retains its world leadership in scientific and technological development as applied to weapons and methods of warfare.

The development of the atomic bomb and long range carrying vehicles has had an important effect on our requirement for Armed Forces "in being." Whereas, previously the main mission of the peacetime forces was to provide a framework for wartime expansion behind light covering forces, now it is necessary to have forces in being capable of providing instantaneous defense against air attacks or surface forays against us, of minimizing the effects of such attacks, and of concurrently launching counterattacks against vital enemy targets, including the bases, launching sites, and industrial facilities which support an enemy atomic attack and are invulnerable to our aerial counterattack.

DEFENSE FORCES REQUIRED

We require, in the first instance, defensive forces capable of intercepting and destroying aircraft and/or guided missiles. Such forces include both intercepting aircraft and ground weapons, utilizing special air-to-air and ground-to-air missiles. The success of their operations will depend to a great degree on the efficiency of our radar detection net which will be necessary to provide early warning of attack—"early" in the sense of seconds, or at the most, minutes. The well-planned, well-coordinated attacks of a determined enemy, once launched in strength, can be expected to achieve their objectives even though the defender can impose extremely heavy attrition on present-day long range bombing aircraft. Consequently, an atomic attack on the United States can be exceedingly destructive in spite of the success that a stubborn and determined defensive action may have in decimating the attacking force. The objective of the defense can only be reduction of the effects of the attack and infliction of such heavy damage on the attacking forces as to destroy the enemy's resources available for continuation of such attacks.

Since such attacks may be accompanied or immediately followed by airborne and seaborne invasion forces, seeking to capitalize on the disruption effected by the attack, our military establishment must include forces capable of defeating any such action. Again these forces must be forces in being and highly mobile, in order to keep their numbers to a reasonably low figure. They must be well balanced, including shore defense naval units, armored, airborne, and mobile infantry forces with their supporting groundsupport air units and other arms.

The most important aspect of the absence of a preparatory period is that our counter-attacking forces must be ready for instant retaliation. Our requirement is for strategic bombers, and for long-range guided missiles when they are developed, to carry atomic explosives immediately to those installations, probably deep in enemy territory, which are vital to the continuation of his early attacks on us or which are necessary to his general war effort. We will need bases so located that our bombers and missiles can reach those vital installations. It is only by such offensive air action that we can quickly deliver substantial blows by which we may save ourselves from defeat in the initial stages of the surprise war and seize the initiative necessary to gain final victory. Forces in being will have the additional mission of quickly reinforcing or seizing essential bases, and of undertaking such timely military operations as will blunt the hostile offensive and gain for us an advantageous military position.

STRATEGIC BOMBING NEED CONFIRMED

Our present strategy recognizes the over-riding importance of strategic bombing. This concept has been developing with the technical perfecting of long-range aircraft, but it has been confirmed and emphasized by the development of the atomic bomb, since the scale of destruction of this weapon has given the offensive such a marked advantage, at least for the time being, over the defensive. It was possible, as long as strategic bombers were limited to the use of conventional explosives to exact such a price from the attacking force by improved methods of defense as to make the success of such offensive measures doubtful. With the pay load atomic explosives, however, great destruction is achieved cheaply (in terms of resources and manpower), and foreseeable defensive means are unable to keep pace with

offensive methods. It is our belief now that strategic bombardment either by piloted aircraft or by guided missiles of one form or another provides the single most important element of our military capabilities.

BALANCED FORCES STILL NECESSARY

The atomic bomb, primarily an offensive weapon, serves to emphasize the principle that only by offensive action can victory be attained. However, the development of the atomic bomb by other nations requires that the U.S. adopt a principle of strategy in seeming conflict with the fundamental importance of offensive effort. We must devote a higher percentage of our national resources than ever before to the measures we take for defense. We must do this in order to insure that we retain the capability of delivering effective offensive effort. Unless we provide adequate means to reduce our vulnerability we may find in the moment of emergency that we are unable to launch our own atomic offensive. A careful balance must be attained. Land and sea radar outposts are required to give early warning; aircraft and ground weapons are required to intercept and destroy a maximum number of airborne bomb-carrying vehicles; and aircraft and naval craft are required to intercept and destroy a maximum number of water-borne (surface or sub-surface) bomb-carrying vehicles. In addition balanced forces are required to repel any air-borne or water-borne invasion forces which might attempt, in connection with an atomic attack, to seize objectives in the U.S. or to carry out raiding missions against installations in the U.S.

The initial strategy of the Armed Forces, in the light of the loss of our cushion of time, is that of absorbing or diverting initial attacks, delivering immediate counterattacks with long-range bombers or missiles, accomplishing initial, essential deployment, and effecting without delay the necessary mobilization of national resources.

The time afforded us for mobilization may be so relatively short and the interference so great that we may have extreme difficulty in mobilizing large field forces such as we mobilized in World War II. Victory or defeat may have been realized before large forces could be brought to bear. It must be borne in mind, of course, that we have no assurance that our atomic warfare capabilities are, or will be, fully sufficient to accomplish our strategic aims. It might develop that such factors as availability of raw materials would force us to supplement the employment of atomic weapons with substantial employment of non-atomic weapons and methods of warfare. Since it is politically and economically unfeasible to retain "in being" forces sufficient to discharge all requirements of an atomic war, there remains a vital need for rapid mobilization of manpower as well as industry. We must have on call a reservoir of partially trained men who can quickly be assimilated and employed in reinforcing our initial efforts, including deployment to distant areas, and carrying the attack through to final decision. A careful balance must be effected as between the manpower requirements of industry and those of the Armed Forces. It appears that numerically the demands of industry are continually increasing with scientific and technological development. These demands are likely to impose a heavy drain upon manpower, which in final analysis may be reflected in decreased manpower in the Armed Forces proper.

FAR-FLUNG BASES NEEDED

In addition to providing forces in being, how can we increase our capability successfully to accomplish our rapid mobilization?

We have need for a system of far-flung bases whose installations can provide early warning of attack and contribute to the interception and destruction of the vehicles of attack. Securing such a system may be at the expense, in some instances, of our political position, which is our first line of defense. Under such circumstances, a purely military aspect will often be overruled by the fact that more National Security can be achieved through political position than military position. Keeping in mind this factor, which may militate against our realization of as complete or efficient a system of bases as would be militarily desirable, the primary function of the bases would be to provide early warning of attack aimed at the U.S. proper and interception of a number of the vehicles of the attack, whether they be airborne or surface-borne. The bases would also provide the launching sites for counterblows against enemy territory. Obviously, these blows can be more effective if launched from a point close to their target than from a distant base in the U.S. In the long run the North American continent is not to be defended as an island. Adequate defense requires decisive offensive action, a substantial part of which may be necessary shortly after the initiation of hostilities. In order to insure that such bases are prepared to carry out their functions in time of war, they must be maintained adequately during peacetime, garrisoned with sufficient troops to protect them against small scale attack, and equipped with such installations as airfields or launching devices for their offensive role. Communications to them must be maintained and the control of air and sea approaches to them retained by the U.S. It is recognized that the maintenance of such installations is expensive and that in event of limited budget many of the bases would have to be abandoned in favor of the more vital military establishments such as the strategic air striking forces and defensive forces in being. It must also be borne in mind that no one base can be fortified or garrisoned to such an extent that it would withstand a concerted enemy attack, and hence, it must be accepted that a certain number of our bases might well fall to the enemy at the initiation of hostilities. Further, it may be pointed out that an alternative is to wait until the advent of hostilities to seize certain of the bases we need, assuming that we maintain our advantageous position with respect to Naval and Air power in order to retain the capability of doing so.

While it is recognized that widespread dispersion and establishment of underground facilities is impractical, we must achieve that minimum degree of such protection essential to the preservation of our retaliatory counter-offensive power. The pattern of U.S. life, social and industrial, will

never permit the degree of dispersion which military strategy makes desirable. We can disperse the bulk of our critical military stockpiles. We can disperse some of our vital industry, particularly new plants. We can probably never achieve substantial dispersion of our general industrial concentration, in spite of our reliance on it for continuation of a war effort. Nor are we likely to be able to disperse government and other control and communication agencies which bind together the efforts of the whole nation toward National Security. What we must do, then, is to select those facilities absolutely essential to our fight for survival and effect a minimum dispersion, protection, or duplication of them to an extent which is both practicable of attainment and sufficient to give promise of success.

PROBLEM OF DISPERSION OF INDUSTRY

That success in this respect is not hopeless may be indicated by the historic examples of industry's ability to survive, demonstrated by German industry in World War II, which not only survived but increased its output up till 1944; and the Russian industrial effort, which survived the great German territorial advances which overran or destroyed industrial capacity representing equivalent results of an enormous amount of strategic bombing. Complete dispersion of our cities of over 50,000 population, which number some 200 and total 50 million inhabitants, appears beyond our capabilities — not because of requirements of money or engineering effort, staggering as they are, but because of the political resistance of our people against being regimented, uprooted, and forcibly moved. Our strategy must be based on realism, and the all-out dispersion of industry can only be classed as a militarily desirable but unattainable measure. In addition to limited dispersion we must effect substantial stockpiling. The equipment and supplies of our forces in being, particularly our atomic weapons with their carrying vehicles, must be stockpiled in numbers sufficient to sustain our initial efforts and to carry over until such time as production of essential items can be resumed. We must also stockpile those items which are vital to our rapid mobilization and whose replacement takes long periods of time.

SCALE OF POSSIBLE DEFENSE LIMITED

Dispersion and protection are two mutually supporting defense measures. By going deeply enough underground or by providing a protective shield of sufficient concrete, lead, or other protective materials, it is possible to achieve comparative safety from the bomb effects. The scale of such an effort limits its use to a comparatively few extremely vital installations or facilities which must be retained in operation at all cost. Nerve centers, such as key government or military headquarters and certain command and communications facilities necessary to the carrying out of retaliatory atomic attacks, will require this type of protection. Such installations are inherently immobile and must be self-sufficient in sustaining life of the personnel engaged and in maintaining the equipmet necessary to their operation.

Above all, the advent of the atomic bomb demands that we retain flexibility in our military and national organization, and flexibility in our strategy and our planning, if we are to maintain a reasonable and acceptable state of National Security.

There are certain duties and responsibilities of the Armed Forces which are affected little, if at all, by the atomic bomb. These responsibilities include our commitment for the occupation and demilitarization of Germany and Japan, our commitment to provide Armed Forces to the Security Council of the United Nations for the maintenance of international peace and security, and our political requirement to maintain those forces designed to enhance our position in the international balance of power which is continually the object of security considerations even within the framework of the United Nations. There appears to be no possibility that the atomic bomb would be employed in affecting the occupation of Germany and Japan and in carrying out our major policies in those ex-enemy states, any more than we would be likely to use it on the cities of our allies occupied by an enemy. The requirements in these respects are basically those which can be best performed by conventional ground forces, since the duties are police and surveillance duties. The requirement for these forces may extend as long as 25 to 40 years, depending upon the agreements reached by the major powers in the German and Japanese Peace Treaties or other instruments of international policy.

Under Article 43 of the United Nations Charter, the U. S. is committed to provide certain Armed Forces to the Security Council of the United Nations for its use in maintaining international peace. The regulations governing the composition of these forces remain a matter of current United Nations discussion. It appears that a considerable time will elapse before such forces are actually established in being. The requirement will probably be that these forces, held as national contingents by each furnishing nation, shall be available upon notice to the Security Council. It is not contemplated that the atomic bomb will be included in the U. S. contribution to these international forces. Conventional Air units must be included in accordance with Article 45 of the United Nations Charter.

ATOMIC BOMB IS NOT ENOUGH

While the inherent offensive value of the atomic bomb to the U. S. during the period of its sole possession of the weapon is unquestioned, it would be shortsighted to believe that even during this interim period it was sufficient in itself. A large measure of security comes to the U. S. from the very existence of its military strength which is evidenced in its conventional force in being, as well as such unorthodox weapons as the atomic bomb. To retain our strength in terms understandable to all nations, we must continue in existence certain of the forces which clearly spell power to the potential aggressors. These forces include Fighter and Bomber units, Infantry Divisions and Aircraft Carriers; in short, the conventional forces that the man on the street can recognize anywhere in the world.

Military tactics are relatively unaffected by the advent of the atomic bomb. Until it has been demonstrated that the atomic bomb can achieve a

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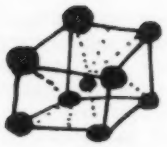
THE WORLD GOVERNMENT MOVEMENT IN THE UNITED STATES



Harrison Brown

The American public is beginning to speak glibly of world government as a panacea for the world's ills, yet few people are familiar with the organizations that have worked to stimulate this growing popular demand. This article outlines the organizations most active in the field and the points of view that distinguish their approaches to the problem. Harrison Brown is a member of the Institute for Nuclear Studies at the University of Chicago and is on the Board of Editors of the BULLETIN. He has been active in the educational program of the Atomic Scientists.

Most persons of my acquaintance, including scientists, when asked their beliefs concerning the most desirable solution for the critical ills of the world, highlighted in large measure by the advent of new weapons of mass destruction, will state: "a world government." But there agreement ends.

Some persons believe that we can and must have such a government immediately. Others say that the people are not ready for it, but that it will come about eventually. Some say that although a world government is desirable, it will never come into being.

From all sides one hears the question, "What about Russia?" and various solutions are proposed. Some persons want to form a "world government" without Russia, believing that until Russia is democratized she cannot function with the western democracies under a rule of law common to all. Others want to include Russia if she is willing, and believe that if the proper approach is made she will be willing. Some believe that Russia would not join a world government under any circumstances.

On procedural matters, opinions among world government advocates are equally divergent. Some persons want to strengthen the United Nations Charter by the process of amendment. Others want to scrap the Charter and write a constitution. Still others want to have nothing to do with nations as such, and they advocate the calling of a "people's world constitutional convention."

Concerning the type of government desired, advocates may be readily found representing nearly all shades of opinion. Ideas range all the way from a strong central government with powers in all zones of international intercourse, down to a government with powers only over the production of weapons of mass destruction and over national military forces.

RESHUFFLING OF GROUPS

Quite naturally, advocates of the various shades of opinion organized themselves into groups. During the war, several older world government groups were revitalized, and many new groups came into existence. Hiroshima was, of course, a tremendous stimulus to the movement, and in the period that immediately followed the close of the war, there occurred considerable organizational amalgamation and reshuffling. There emerged the following major independent national membership organizations:

1. Americans United for World Government
2. Student Federalists
3. World Federalists, U.S.A.

In addition, there were many independent state organizations, the largest of which was the Massachusetts Committee for World Federation. There also remained several smaller national groups such as The Committee for a People's World Constitutional Convention and Campaign for World Government.

All of the groups mentioned above believed that a world government including Russia was both desirable and possible. Advocates of Russian exclusion from such a government, including former Associate Justice Owen J. Roberts and Clarence Streit (formerly the leader of the Union Now movement), divorced themselves from the groups listed above at an early date.

DIFFERENT PLATFORMS ADOPTED

Americans United for World Government adopted a platform urging the creation of a world government with powers limited to jurisdiction over national armaments and military forces. The organization proposed that the government be created through the process of strengthening the United Nations by amendment.

Student Federalists and World Federalists, U.S.A. adopted a broader policy. Their platform did not limit the objective to a rule of law over questions involving armaments and military forces. Further, their procedural recommendations were threefold: that the government be constituted either by amendment of the Charter, by drafting a constitution at a convention called by the national governments, or by any "reasonable" process that might prove workable.

The People's Convention for a Federal World Constitution and Campaign for World Government advocated primarily the "people's convention" approach, in other words, action independent of the various national governments.

In addition to the campaigns conducted by the various state and national organizations, a number of persons, working solely as individuals,

carried out effective programs. Notable among them is Robert Lee Humber who, after much effort, succeeded in securing the passage of a world government resolution (usually called the "Humber Resolution") by fifteen state legislatures.

PROGRESS IN CONSOLIDATION

It was realized at an early date that the duplication and overlapping of activities of the various organizations constituted a serious problem, and periodic attempts to secure amalgamation were made by various groups. Success did not come about rapidly, however, due largely to the differences of opinion concerning ends and means. Nevertheless, it was fully appreciated by all groups, that their main task, educating the American people to the concept of federalism, was a task common to all.

In 1946 a new organization, Students for Federal World Government, was formed by a group of students at Northwestern University. The group expanded for a number of months, all of the time becoming more concerned with the lack of coordination between the various organizations. In November of that year, at the instigation of the student group, a meeting was held in Chicago for the purpose of discussing the possibilities of coordination. The groups present managed to agree to form a central coordinating council and to prepare for a larger meeting at a later date.

The second meeting, a convention, was held in Asheville, North Carolina, in February, 1947. At the Asheville meeting, the following groups amalgamated into a single organization called United World Federalists:

1. Americans United for World Government
2. Massachusetts Committee for World Federation
3. Student Federalists
4. World Federalists

United World Federalists adopted a platform urging "a world government of limited powers, adequate to prevent war." Further, a policy of working through the United Nations was adopted.

Other organizations did not amalgamate into United World Federalists, primarily because of the "people's convention" versus the "work through the United Nations" conflict. Students for Federal World Government, which had changed its name to World Republic, was the largest group deciding not to amalgamate. The others included the People's Convention for a Federal World Constitution and Campaign for World Government.

Briefly then, the *status quo* of world government organizations is as follows:

United World Federalists Inc.

Offices: 31 E. 74th Street, New York, N. Y.

As of this writing, the organization does not have a president. However, the following vice-presidents have been elected: Grenville Clark, New York lawyer; Norman Cousins, writer and Editor of the Saturday Review of Literature; Thomas K. Finletter, New York lawyer, formerly with the State Department; W. T. Holliday, President of the Standard Oil Company of Ohio; Robert Lee Humber, of "Humber Resolution" fame; and Raymond Swing, radio commentator.

Prior to amalgamation, the amalgamating groups had approximately the following paid memberships: Americans United for World Government, 5,000; Massachusetts Committee for World Federation, 1,000; Student Federalists, 4,800; World Federalists, 6,000. The total of nearly 17,000 members should correspond roughly with the present membership.

In the twelve months prior to amalgamation, all groups combined spent nearly $250,000, the largest part of which was spent by World Federalists ($100,000) and the smallest part of which was spent by Student Federalists ($25,000).

United World Federalists has, at the present time, State Branches in 15 states, including several former independent state organizations. The organization will have a Student Division under student direction. At the present time there are 150 individual student chapters.

World Republic

Offices: 807 Davis Street, Evanston, Illinois.

Until recently, this organization was called Students for Federal World Government. The leaders are J. Whitehouse, Fred Carney, Phillips S. Ruopp, and David McCoy. The organization has undertaken an extensive educational program. During the twelve months prior to the Asheville Convention approximately $50,000 were spent.

Unlike most organizations in the field, World Republic has limited membership to those persons who will actively participate in the movement. A substantial fraction of the members have given their personal savings to the organization, left their jobs, and are devoting full time to organization activities. Dormitory and kitchen facilities have been built into their quarters and the members work in three shifts.

World Republic is concerned primarily with the "people's convention" approach to world government, and this constituted the prime reason for the decision not to amalgamate with the organizations which formed United World Federalists.

In conjunction with its world government activities, World Republic operates a sizeable world relief drive.

Campaign For World Government

Offices: 343 S. Dearborn Street, Chicago, Illinois.

This organization is the oldest in the field, having been formed in 1937. The Executive Secretary is Miss Georgia Lloyd and the International Chairman is Mme. Camille Drevet.

Campaign for World Government is not a membership organization. It considers itself primarily a "catalyst" in the field. The organization aims at the establishment of a federal government, democratic in form, through the means of a people's convention.

People's Convention For A Federal World Constitution

Offices: 110 Woodland St., Nashville, Tennessee.

The Director of this group, Mr. Fyke Farmer, is a Nashville (Tenn.) lawyer who has left his practice to devote his full energy to the task of organizing a people's convention. The group is now in the process of organization.

The activities of the world government organizations have been rather widespread. All of them have used every means at their disposal to educate the American people to the concept of federalism. In addition, some of the groups have concerned them-

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THE SENATE DEBATES MR. LILIENTHAL'S CONFIRMATION

(March 24—April 9, 1947)

THE LILIENTHAL VOTE

On April 9th the Senate confirmed the nomination of David Lilienthal as Chairman of the Atomic Energy Commission by a vote of 57 to 38 (counting "the pairs"). It will be noted that *all* members of the Senate (Senator Bilbo being still unseated) have registered their opinion, in contrast to 18 months ago, when the McMahon Bill passed the Senate by voice vote, with only a few senators present on the floor. Much of the excitement of the present debate was due to its personal aspect. However, the division was more than just an expression of personal confidence or distrust of Mr. Lilienthal. Since the passage of the McMahon bill, the growing feeling that we are engaged in a race of armaments with the U.S.S.R., has awakened the forces of near-sighted nationalism; the vote against Mr. Lilienthal was the mustering of all those who think that a "security" of sorts can be bought by sacrifice of freedom and progress, and are out to scuttle our present enlightened international policy in the field of atomic energy. Viewed in this light, the Lilienthal victory by only 19 votes appears as a rather disturbing reading of our atomic fever chart.

ATOMIC ENERGY—A WEDGE FOR SOCIALISM?

Another issue brought up in the debate was whether national control of atomic energy could lead to a dangerous breach in the private enterprise economy. Senator Taylor (D., Idaho) alone supported national ownership of power plants, and accused the opposition of subservience to private utilities. All the other speakers recognized the national monopoly of atomic energy only as a painful necessity. Two opposite conclusions were drawn from this recognition. Supporters of Lilienthal said that even though government monopoly is an unavoidable calamity, the proper man to administer it is the one best qualified by experience and inclination to make such monopoly a success. Opponents argued that the McMahon bill did not provide for *complete* monopoly, and that in order that proper discretion be exercised, the Chairman of the Atomic Energy Commission must be a strong believer in private enterprise—a qualification which they thought Mr. Lilienthal lacks. We quote **Senator Taft** (R., Ohio): "The Commission is now operating a city of 45,000 people at Oak Ridge, Tenn. Recently we heard that all the concessions in Oak Ridge were being cancelled and that the Authority itself was to operate all the restaurants, soda fountains, and anything else that related to housing, health, safety, and welfare of the personnel. The fact that the law is radical is all the more reason for refusing to appoint a radical whose philosophy shows that he is in favor of Government operation if it can possibly be had. We give these men discretion as to how far some part of atomic energy may remain with private enterprise. We ought to have persons who believe in private enterprise.

"I think what Mr. Lilienthal wants is to have the Federal Government run everything. That is exactly what I think this Congress does not want.

"Today in the United States, there are only a relatively few men who have the philosophy that Mr. Lilienthal has. Why we have to give to that group the unlimited authority which is granted by the Atomic Energy Act, I cannot understand."

The same point was labored by **Senator Ferguson** (R., Mich.): "Anyone professing to believe in the constant expansion of government in planning, ownership, controls, and paternalism, heads in the direction of the authoritarian state. If such a person were to head atomic energy development, every decision, every undertaking, every act in that regard would widen the framework of government domination. I am sorry that the nature of the force compels that form of development. I submit to government monopoly only because security makes it imperative until international agreement makes atomic development safe.

"From an examination of Mr. Lilienthal's writings, addresses, and activities at TVA, I am convinced that he is one who would push big government until Government dominated the lives and property of all its people. Wherever he has his choice between encouraging private and public enterprise, he will lean to public enterprise. He wants the Government to plan, to own, to control directly where possible and by money indirectly.

"Those who would govern us in this way subscribe to the belief that modern life has become too complex for the people to govern themselves. They believe that this is the day of experts, of a special managerial class to whom the people must grant broad powers.

"Development of the atom bomb should not be in the control of people who are so naive as to think they can manage our affairs without leading us down the road to tyranny. Why did we take this power out of the hands of the military and place it in civilian hands? We did it because many people were fearful of the military frame of mind. Well, I am fearful of the authoritarian frame of mind—of the people who would push Government ownership, planning, management, and control over our lives."

It is a sign of the times, that Messrs. Ferguson and Taft were contradicted by such conservatives as Senators Vandenberg (R., Mich.) and Hickenlooper (R., Iowa) whose speeches are reported further below. Both expressed the hope that once the international situation has improved, atomic energy will be turned over to private enterprise. However, since even they agree, that easing of world tension requires the creation of an international monopoly of atomic energy, the chances of atomic power ever being turned over to private economy appear to be very doubtful. We have here an objective factor—the importance of which cannot be predicted at the present time—which may permanently influence the American economy towards increased Government control. This aspect of atomic

power calls for unprejudiced analysis, to which the BULLETIN hopes to be able to contribute in its future issues.

"BIG SCIENCE" FEARED BY SEN. BREWSTER

Scientists, since they "went to Washington" have often wondered how the Senators feel about their coming. Following are some critical remarks:

Senator Brewster (R., Me.), said: "We have heard the suggestion repeatedly from scientists that they were going on a sitdown strike. That is pretty near to deserting in the face of the enemy."

When **Senator McMahon** quoted Compton, Fermi and Urey in support of the view that all atomic energy developments will be disorganized by failure to confirm Lilienthal, **Senator Bridges** (R., N. H.) called this "pure undiluted bunk".

Senator Smith (R., N. J.) then read from a letter by Dr. Karl Compton: 'I am very much worried lest failure to confirm Lilienthal may pretty much wreck the atomic energy program. The key men have confidence in him, and are disgusted with the way he has been handled. All these key men could step into other attractive jobs easily'.

Mr. Brewster: "What the Senator from New Jersey has read is another expression of a profoundly regrettable nature. That injects the idea that unless we all sit in a sacerdotal attitude accepting the edict of the scientists as to the solution of what, after all, is primarily a question of business management of a great governmental enterprise, they will not play on our team.

"I think Dr. Conant or Dr. Compton or any of the others if they realized the implications of these suggestions would be the first to regret them.

"Mr. President, we had a period from 1920 to 1930 when big business was in the saddle. We have a period now when we are challenged by big labor. And apparently the suggestion is now being made that over the horizon big science is preparing to move onto the scene.

"And I say to my friends in science that greatly as we appreciate their achievement, profoundly as we respect their knowledge, they do not have a monopoly on the political wisdom that is essential to the solution of the problem we here face; and with all deference we say to them that if they will show a little more deference to the Congress of the United States, as possibly having an equal patriotic devotion to the common good, and perhaps a little understanding of all the political aspects, and that perhaps it is a subject to which some of us have devoted our time and talents, and if there will be a little recognition on their part of our knowledge regarding some aspects of the conduct of governmental business with which they have not been hitherto concerned, it would be a salutary lesson to the people of the United States."

Mr. Bridges: "I want to compliment the Senator from Maine. To me it is a terrible thing that scientists should infer that they are going on a strike against America simply because the Senate does not do what they want done."

Mr. Smith: "I know that the statement that Dr. Compton made to me had nothing to do with a strike. The scientists are very much disturbed because they turned loose in the world something more terrible and destructive than had ever before been known. They are concerned that there should be lengthy discussions over the pending nominations and delay in dealing with the subject. I want to commend them for their deep sincerity and I want to enter a protest against the suggestion that there is in their minds such a thing as a strike against America.

"These men are trying to show to the country that what we are now dealing with is something much more serious than anything ever before dealt with in the history of the world."

HICKENLOOPER'S DEFENSE OF LILIENTHAL

An encouraging aspect of the Lilienthal debate was the enlightened attitude of those Senators, whether Republicans or Democrats, who have had prolonged contact with the problems of atomic energy by their service on the Atomic Energy Committee.

We quote first from **Senator Hickenlooper's** opening speech: "The Senate Committee gave intensive time and attention to the formulation of a peacetime legislative policy. The result was the Atomic Energy Act of 1946.

"Since then, a year of uncertainty had passed; scientists and engineers began to drift away from the project; no one could be certain just what the final program might be. The military administration did keep the activities connected and intact, but it is only fair to say that the extent of advancement during this period has not been as great as it could have been under settled conditions.

"The United States and the world cannot afford to brook further confusion, uncertainty, and stagnation of the progress we must maintain for the assurance of our system of human freedom in these uncertain times.

"The hearings before the Senate Committee have been protracted and exhaustive. Every substantial suggestion touching upon the qualifications of these appointees was investigated; upon the whole record the Committee came to the conclusion that the Commission appointees and the General Manager should be confirmed and the Committee so recommends.

"I think the evidence affirmatively shows that Mr. Lilienthal is fundamentally committed to the basic principles of Americanism with a deep and intelligent understanding of all the connotations of those principles.

"The evidence further establishes, in my mind, that Mr. Lilienthal is a man of high intelligence, great administrative ability, and vigorous devotion to the successful operation of any enterprise with which he is associated. I might disagree with him on certain important partisan political matters, but my conception of the administration of the atomic energy program in this country is, that it is one field that must be above partisanship."

Senator Hickenlooper then opposed the return of military rule: "There has been injected into the debate the ominous suggestion—and a drive for it seems to be beginning—that atomic energy should again be placed in the hands of the military.

"No, Mr. President; that must not be at this time. If the emergency of war should descend upon us, certainly our entire industrial and economic plant must again be put under the dictation of war controls, but I have heard no one say that the power plants, the railroads, the economy of this country should now be placed in the hands of the military merely because there are rumblings, merely

because there is uncertainty in the world, and fears in high places.

"There are great fears and apprehensions, and in fact there may be ground for them, that tomorrow's war may be fought with germs, with blights, with biologicals, the horror and extent of which no man today can fully realize. If that be the case, should we put all our pharmaceutical houses, all our laboratories, and all our scientific biological experimentation and development projects, under the military? The fallacy of that seems apparent, and I think it is applicable to the great science of atomic energy, just as it is to the science of biology, or the science of bacteriology, or any other science which may be used to destroy mankind if we do not solve the problem of keeping out of war."

In another speech, on April 2, **Senator Hickenlooper** said, addressing Senator Tydings: "Has the Senator considered that it took a totalitarian economic organization to produce the atomic bomb? If we now delay or fail to find a solution for the control of this great force internationally, then we may be forced against our will into a totalitarian state of war production in order to have any semblance of protection against possible invasion. If we have to go into an atomic production race, I see no possibility of carrying it in other than totalitarian economy."

VANDENBERG'S SPEECH

Senator Vandenberg's eagerly anticipated speech was delivered almost at the end of the debate, on April 3. We reprint the essential parts of it.

"I have heard or read every word of the testimony. As a result, I have been driven away from the adverse prejudice with which I started. I have been driven to the belief that logic, equity, fair play, and a just regard to urgent public welfare combine to recommend Mr. Lilienthal's confirmation.

"I say it with a candid expression of regret that other possible nominees whom the President first unsuccessfully sought, declined to serve.

"In the climax of this long investigation, almost without parallel in Senate history, the "jury" agrees—8 to 1—that it is in the public interest for the Senate to confirm Chairman Lilienthal and order him officially to the intensive atomic labors which, for the sake of the public welfare and the national security, have too long lagged.

"But, Mr. President, with varying shades of emphasis, he is charged with either sympathy for communism or too easy toleration of it. It is the opinion of our Committee that Mr. Lilienthal is no part of a communist by any stretch of the imagination. If I were to hold every top executive in American industry personally responsible for the underground communism, which exists in every large employment, I would denude most American industry of its leadership.

"Now let me come to a second charge against Mr. Lilienthal. It is said he is such a devotee of public ownership that he will endanger free enterprise. I am one of those who do not want the Government to compete with private enterprise unless it is an indispensable public necessity. But what are the realities in the instant case?

"We, the Congress, have declared by law that the control of atomic energy must be the tightest Government monopoly ever set up in the United States—pending the day when the destructive use of atomic energy shall be outlawed for keeps. You all voted for it. We solemnly and unavoidably decreed that Government ownership and management, no matter how much we dislike it in other aspects of our national economy and life, is an indispensable public necessity in respect to the control of atomic energy. Therefore one of the most available men to run it is the successful manager of the greatest existing comparable example of public ownership and management. Whether we like it or him or TVA, this sequence leads logically to David Lilienthal's door. His liability under other circumstances thus becomes an asset for the time being.

"It seems to be a fact, despite incidental arguments, that TVA is one of the most successful public institutions of its sort on earth. It is the nearest thing, if not the only thing, comparable in general character to the far-flung empire of the Manhattan project with its vast public investment and its vaster personnel. It is not Mr. Lilienthal's chairmanship which makes the job a public project. We, the Senate, did that unanimously months ago. Rather, it is because we made the job a public project that Mr. Lilienthal becomes peculiarly eligible.

"But we did something else when we passed the original atomic energy bill. We set it down that, when the world is freed of the hazard in the destructive use of fissionable material, we propose to turn this new power back into the relatively free control of competitive American initiative. Indeed, the law requires the Commission to report back to Congress for new instructions whenever the non-military use of fissionable material becomes feasible. Meanwhile, the more expertly the phase of "public monopoly" is run, the nearer we shall be to creating maximum atomic opportunities for transfer to the domain of free enterprise, when that happy time comes.

"Now I come to the third charge. The charge is made that this nominee's connection with the Acheson-Lilienthal report discloses a flaw in his reliability as a guardian of our atomic secrets, because this report did not go to a finality in prescribing the ultimate security system demanded by the later Baruch report. It seems to me this criticism is irrelevant, incompetent, and immaterial. Clearly, its authors were charged with the exploration of physical mechanisms for atomic control; not with the exploration of political mechanisms which became the subsequent responsibility of the Baruch group. But they made an invaluable and indispensable report, without which the Baruch report and the ultimate finished American plan would have been impossible, and—this ought to end this part of the argument—Lilienthal wholeheartedly endorses the American plan, and Baruch wholeheartedly endorses Lilienthal.

"The Acheson-Lilienthal report was approved by a very distinguished board of consultants. Prominent among those consultants who put their stamp of integrity upon this report was the very man who is the idol of all the speeches I have heard here against the Lilienthal confirmation. It is signed by Maj. Gen. Leslie R. Groves.

"I do not know of one single scientific, engineering, or industrial authority who has had anything to do with our wartime triumph in atomic energy and who has testified in this celebrated cause who has not joined in an unbroken record of approval (of Mr. Lilienthal). Where are the comparable witnesses against him, Senators? I confess that these are things that count with me, Mr. President. I am unable to forget what we owe these men. They know whereof they speak. They are not speculating in episodes of ancient history or relative inconsequentiality. They bring to us from the rich experience of their devoted loyalty to their country the advice that this is the thing we should do. They know at first hand. They are not likely to desert their country's welfare.

"I cannot count them as less reliable or less patriotic than we found them to be in war. If Mr. Lilienthal is good enough for them, he must be good enough for the Senate.

"I have no doubt that in the interest of the national welfare and for the sake of a square deal, Mr. Lilienthal is entitled to be confirmed."

SENATOR TAFT CANNOT TELL BARUCH FROM GROMYKO

Once in the Committee, Senator Bricker (R., Ohio) when asked for an alternative to the Lilienthal-Baruch plan, suggested a pact to outlaw the military use of atomic energy—and was advised that this was precisely the Soviet proposal. His senior colleague from Ohio made the same blunder on the floor of the Senate. His misconceptions of the relation between the "Lilienthal report" and the "Baruch plan" lead to the following dialogue:

Mr. McMahon: "I wonder whether the Senator from Ohio has had an opportunity to read the Acheson-Lilienthal report or the propositions which were made by Mr. Baruch?"

Mr. Taft: "I read the report when the Lilienthal nomination first came before the Committee. I also read the Baruch report and the minutes of the Atomic Energy Committee of the United Nations, from which it was perfectly apparent that Mr. Baruch really thoroughly disapproved of the Acheson-Lilienthal report."

Mr. McMahon: "I regret the Senator had not read the report when it was released by the State Department. It was probably as important a proposal as the State Department or any section of it has made on policy in many generations.

"Furthermore, the proposals which Mr. Baruch made to the Security Council are basically the proposals which have been made in the Acheson-Lilienthal report. Mr. Baruch added only one important thing to it, and that was the point with respect to the veto."

The argument was resumed the next day:

Mr. Taft: "It is said that many others joined Mr. Lilienthal in this report. But if Senators will read it, I do not think they can have any doubt that Mr. Lilienthal wrote the report.

"The report proposed that we set up an international atomic development authority, which is described as something as like TVA as two peas in a pod. Certainly this authority would be completely independent of the United States. We would not control the personnel. That means that the great bulk of the personnel would be foreigners.

"When Mr. Lilienthal has set up this organization, it is to move in and take over all our plants. I do not see how we can prevent foreigners from other nations having full access to all those plants.

"The other side of the picture is that the Atomic Development Authority would build in Russia, and in other countries throughout the world, plants exactly like our plants."

Mr. McMahon: "I ask the Senator what he believes should be our atomic energy policy with regard to international control?"

Mr. Taft: "I think we ought to withdraw our offer immediately."

Mr. McMahon: "The Senator feels, I take it, that we should rely upon sitting on a stock of ever bigger and better bombs?"

Mr. Taft: "I think the atomic question involves the subject of disarmament. The only possible way I can see for us to hope that peace may ultimately come in the world is through a general agreement for disarmament, enforced by military forces sufficiently strong to attack any nation which violates its disarmament agreement."

Mr. Capehart: "Why is it not a sensible program, in view of the world conditions, to return atomic energy to the military forces?"

Mr. Taft: "I would favor returning it to a military commission. The Panama Canal was to be built by civilian engineers, but before we got through with it, we said to the Army, 'You build the Panama Canal', and the Army built it. I think the Army is competent to handle a job that civilians are competent to handle."

Returning to the Lilienthal-Acheson report, Mr. Taft said: "If communists can infiltrate into TVA they can certainly infiltrate into any international agency. If this international authority happens to be more Russian than American, there is no way by which we can restrain them from developing in Russia bigger and better bombs than in the United States. It seems to me that this is the most naive report that could be made by any man who has ever dealt with an international problem."

While asking for the withdrawal of the present American plan, Mr. Taft thought that the original Lilienthal report was much worse:

"The general findings and recommendations approved by the Atomic Energy Commission on December 30, 1946, seemed to be very different, indeed, from the Acheson-Lilienthal report. In addition to dealing specifically with the veto power, there is no mention of an international atomic development authority. The emphasis is on an international agreement to outlaw the production and use of atomic weapons.

"There is nothing in the present proposal which carries out the Lilienthal idea that we should distribute plants all over the world in order to get security. So far as I can see, the Lilienthal report has simply faded into the background."

Mr. McMahon: "In his speech on June 14 Mr. Baruch advocated:

1. Managerial control or ownership of all atomic energy activities potentially dangerous to world security.

2. Power to control, inspect, and license all other atomic activities.

3. The duty of fostering the beneficial uses of atomic energy.

4. Research and development responsibilities of an affirmative character.

If that is not the Lilienthal report line for line and word for word, then I cannot read the English language."

Mr. Taft: "I have heard—I do not guarantee the accuracy of it—that Mr. Baruch said, when he was appointed, that there was a report, and that he was supposed to be bound by it. He said, 'I offer this as a basis for discussion, but'—

"Then he goes on for 6 pages of 'buts'.

"I think it is fair to say that the conclusion is that he did not like it very much."

Mr. Lucas: "The Senator indicates that we are giving everything away to Russia under this plan. Can the Senator tell me, if that be true, why Russia does not accept this plan in a hurry?"

Mr. Taft: "I think it is because Mr. Baruch came in with a veto power, and they thought the left-wingers in the United States, like Mr. Lilienthal, were going to get this thing through without the veto power. They did get Mr. Baruch out of the picture. I think Russia's refusal of the Lilienthal report is because they think they can get rid of the veto power.

"I think the only explanation for this report is a submission on the part of its authors to the theory which spread so rapidly through the United States. I cannot help thinking that it had some foreign support or initiative, but it reached many Americans well beyond the influence of Communist propaganda—the theory that there is no defense against the atomic bomb, there is no way to prevent other people from getting it, therefore we might as well give it away at once."

Senator Taft seems to be under the delusion:

(1)—That an agreement on outlawing atomic weapons, supported by inspection (of a kind in which no "foreigners" will be permitted to snoop freely in our plants?), and providing for enforcement without veto, is the final "American plan", as adopted by the UN Commission on December 30. In fact, this is precisely the "Gromyko plan", only with the addition of the veto clause.

(2)—That the "Lilienthal plan" of an Atomic Development Authority, providing for international ownership and management of atomic energy plants, has been favored by communists, but rejected in the final UN plan. In fact, international management of "dangerous" atomic energy activities remains the cornerstone of the plan and has been the main target of Mr. Gromyko's criticism.

(3)—That the assertions that "there is no defense against the bomb" and that "other nations will have them" are communist-inspired propaganda. Actually the official communist line has been to disparage the military effectiveness of the bomb; and the impossibility of adequate defense—meaning by "adequate" a defense which could prevent large-scale devastation of American cities—has been asserted by all responsible American Army leaders.

Finally, Mr. Taft proposes that the question of atomic energy control be merged with that of general disarmament—again unwittingly supporting the Soviet Union's proposals and opposing the American policy.

MCMAHON'S SPEECH

We now quote from a speech by **Senator McMahon** (D., Conn.) who was the first chairman of the Senate Atomic Energy Committee.

"I am obsessed with the fear that we shall not match our physical accomplishment with our actions in the field of ethics, morality, law and order. Mankind has finally reached an achievement by which he may destroy himself. The other night I was looking in the Book of Revelations. I could not but wonder whether we had achieved the first step in that horrible prediction.

"This is the all-controlling weapon. Stalin does not think so—at least that is what he said. Perhaps his lowly estimate of the capacities of the bomb were somewhat influenced by the fact that he did not have it yet.

"Despite the assertions of the Senator from Ohio (Mr. Taft) there is no defense against it, and unfortunately and unhappily our scientists and military men do not foresee the possibilities of a defense.

"Regardless of what the Senator from Tennessee (Mr. McKellar) believes, it is impossible for any nation to maintain for a long period of time a monopoly on this death-dealing device.

"I have heard Senators declare on this floor that we should outlaw the bomb. That is exactly the position Stalin takes. For my part, I am not going to vote for any outlawing of the bomb, and trust to the chance of any other nation using it against us.

"I say: if Gromyko uttered the last word four weeks ago tomorrow on the international control of atomic energy, if the door has been finally closed, on that day the United Nations died. I say that if an association of nations which has gathered for the primary purpose of organizing law and order and peace, cannot solve the basic and first problem that hangs like a dark cloud over the minds of men—then its raison d'etre has disappeared.

"What I have never been able to understand is how Senators who have damned this proposition believe that they have any prescription for the security and safety of the American people except the operation of this plan. Do they feel that the possession of a large stockpile of bombs is going to protect this country? We in America are so susceptible to atomic warfare, with 52,000,000 people in, I think, some 60 cities. If those cities should be struck or even a goodly portion of them, then I say that this nation could not continue as a fighting nation.

"We have had an atomic disarmament conference in existence since last June 14. We have made our proposals, we have discussed them, we have tried to secure agreements respecting them and we have to this point failed. I have not given up hope, however. I cannot believe that if we demonstrate to Russia that we intend to present our proposals and maintain them firmly that she can in the face of acceptance by all the other nations on earth, finally reject them. So I live in hope that the day will come when we will secure the agreement.

"I regret the undue stress that we have placed on the veto question. I think we have made a mistake psychologically in the stress we have placed upon it, when we did not focus the attention of the world on the fact that we were insisting on control and inspection, that those were the things which Russia really basically objected to. I say to the Senate that it is so important, so vitally import-

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BOOKS

EXPLAINING ATOMS TO PEOPLE

The atomic bomb has initiated, among other things, a sizeable output of books designed to educate non-scientists into the intricacies of nuclear physics. Some of the books have been well done, and some of them have been poorly done. But, good or bad, it is interesting to speculate on their relevancy.

Many persons believe that if they are to understand the implications of the release of atomic energy, they must understand the various phenomena of nature involved. Some of them are firmly convinced that before they can understand the political negotiations on the control of atomic energy, they must first understand the science underlying the production of a chain reaction. An understanding of the latter, they feel, is hopeless; and as a result, the subject is frequently dismissed with statements such as "It's too deep for me . . . I never did know anything about science."

Such beliefs are unfortunate. The same persons would not attempt to understand the physics of telephone communication before commenting on the effects of telephone strikes in their communities. Nor would they attempt to understand the chemistry involved in the production of high explosives, before commenting on the relationships of high explosives to war. And yet, the development of the atomic bomb is so intimately tied up, in the public mind, with science and the scientist, that the belief is widespread that the science involved must be understood before the implications can be comprehended.

Unfortunately, all too frequently, scientists and popularizers of science stimulate such beliefs by their writings and lectures. It has been my observation that in many books, articles, and conferences on atomic energy, the scientific aspects of the problems created by the atomic bomb are discussed in much too detailed a manner. By the time the scientific conclusions are reached the reader or the listener is so confused and tired, that he is unable to follow the problem further.

We must remember that scientific conclusions concerning atomic energy represent only the starting point in the thinking that must be done by the public. If people are confused before those conclusions are stated, they will quickly drop the subject from their minds.

I do not mean, by the above comments, that science should not be popularized—if popularization is well done, it can indeed serve a useful purpose. I mean only that the popularization of science, particularly with respect to atomic energy, should be placed in its proper perspective. Science written for the non-scientist can be stimulating, it can satisfy the minds of the curious, it can give a solid foundation for constructive thought. But non-scientists must not be made to feel that it is necessary for them to understand scientific detail before they can act intelligently.

In the field of popularizing the scientific aspects of atomic energy, some extraordinarily well-written books have been published recently, three of which are reviewed in this issue. These new books serve to neutralize, at least to some extent, the effects of the very low caliber of the hastily written scientific popularizations published shortly after Hiroshima.

Until this month, Dr. George Gamow's "Atomic Energy In Cosmic and Human Life" stood out as the only adequate popularization of the scientific aspects of atomic energy (the "Smyth Report," with no reflection upon Dr. Smyth, was more of a Who Was Who In Atomic Energy, than a popularization). Dr. Gamow's excellent book is now joined by John Campbell's *The Atomic Story*, O. R. Frisch's *Meet The Atoms* and Selig Hecht's *Explaining The Atom*. From these four books, the inquiring layman should be able to choose at least one that is suited to his taste. H.B.

THE ATOMIC STORY. By John W. Campbell. New York: Henry Holt and Company. 1947. 297pp. Illustrated. $3.

The Atomic Story is written specifically for the layman. The book is divided into three parts: Part One gives a general background, in chronological form, of atomic and nuclear physics. Part Two consists of a brief survey of the various wartime activities of the Manhattan District. In Part Three, the author discusses the social, political, and economic implications of atomic energy and atomic bombs.

The author has accomplished a good job in bringing under one cover sufficient material to permit the layman to form an intelligent opinion concerning some of the problems created by atomic energy.

There are a few errors that bear mentioning. For example, Lord Rutherford, Niels Bohr, and Albert Einstein are called the "three Grand Old Masters of nuclear physics," a statement which in itself is agreeable enough. However, the additional statement is made "and these same three men worked on the Manhattan Project that devised the first atomic bomb." Rutherford died in 1937.

The national honorary scientific society devoted to encourage research in science, Sigma Xi, is confused with the social fraternity Sigma Chi.

The statement is made that nuclei contain positrons, protons, and neutrons, but in a later portion of the book nuclei are described as consisting of protons and neutrons in accord with present thought.

On the whole, however, the book is well written, the drawings are clear, and in general the merits far outweigh the errors. The book is to be recommended. —J. Bigeleisen.

MEET THE ATOMS. By O. R. Frisch. New York: A. A. Wyn, Inc. 1947. Illustrated. $3.

The teaching of physics has been made easier by the publication of this book. It is interesting to note that the most lucidly written introductory books on atomic physics have been written by eminent physicists themselves—Einstein, Born, Gamow, and now Dr. Frisch. His book deserves favorable comparison with the best efforts of his eminent predecessors in the popular field. There is no doubt that the average reader will learn a great deal of physics in reading it, and can proceed with confidence in the accuracy of the material despite its lucidity.

The impact of science on the average person's life in recent years has been so great that the interest in books of this sort probably will be

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UN ATOMIC ENERGY NEWS

SECRET SESSIONS ADOPTED

During April, all deliberations of the UN Atomic Energy Commission took place behind closed doors. The negotiations obviously did not benefit in the past from the light of publicity, where sham issues with great popular appeal created excitement while really important issues remained in the background. For example, the almost unnoticed question, whether the Russians definitely refuse to permit serial survey for discovering illegal uranium mining, may be much more important than their widely publicized desire to see American bombs dismantled after the conclusion of the convention.

As far as can be judged from the laconic press releases, the following developments have taken place in the UN Commission:

March 25: The *Working Committee* met under the chairmanship of Mr. Gromyko to discuss the procedure to be adopted in an effort to formulate a convention as required by the Security Council resolution.

When Mr. Gromyko's amendments were presented to the Security Council in February, commentators noted that the first of them asked for international management of American plants. In his speech on March 5, on the other hand, Mr. Gromyko refused to give the control agency managerial functions. He now amended his amendments by excluding the word "management", thus making clear that the Soviet Union wants no part in the management of American plants, and also refuses the international organs the right to interfere with management of Russian developments.

March 31: A resolution on procedure, based on the French compromise proposal was adopted in the *Working Committee* by 10 votes to 0, with U.S.S.R. and Poland abstaining:

"The *Working Committee* resolves to consider at its meetings the points of disagreement outlined in the statements of the representative of the U.S.S.R. in the Security Council.

"At the same time the *Working Committte* requests Committee 2 to proceed by means of formal or informal meetings and conversations, with the study of the various questions following from the resolutions of the Atomic Energy Commission and the Security Council; in particular, questions outlined in the last paragraph of part I of the first report of the Atomic Energy Commission."

(This paragraph referred to "many important questions, which have been considered only in broad outline," and "remain to be further studied by the Commission," such as "the detailed powers, characteristics, and functions of the International Control Agency", its "organization, financing, and staffing: the relationships between the Agency, the various organs of the United Nations, and the participating states; powers of agency in matters of research, development, and planning; the provisions for transition to the full operation of the international system of control.")

COMMITTEE STUDIES OUTLINED

The adopted procedure thus provides for discussion of the Soviet amendments (in the Working Committee) and, simultaneous study of detailed plans for international control (in Committee No. 2). Both Committees contain representatives of the same 12 nations, but Committee 2 works more closely with scientific and technical advisers.

It seems that Mr. Gromyko was dissatisfied with the compromise resolution because he wanted not only the Working Committee, but also the Committee No. 2 to be open for discussion of Soviet amendments. The amendments he proposed in February, he said, applied only to the Section on "Recommendations". He said that he intends to present other amendments in the Control Committee. His alternative resolution, making the instructions to the Committee No. 2 less specific, was defeated by 5 votes (U.S.S.R., Poland, Australia, Belgium, China) to 7 (U.S., United Kingdom, France, Colombia, Syria, Brazil, Canada).

April 8: The discussion in the *Working Committee*, with Sir Alexander Cadogan (United Kingdom) in the chair, started with the first Soviet amendment (See Bulletin, Vol. 3, No. 3, p. 87), which provided that supervision and inspection on the part of an international agency shall be applied to all existing plants—immediately after the entry into force of the Convention. Mr. Gromyko stated that this amendment is intended to complement and not to replace the corresponding section of the report, and that the Soviet Union accepts the safeguards proposed in the report with the exception of management in the sense of direct administration of plants and laboratories by the International Control Agency. He agreed that control should be exercised at all stages from mine to final atomic energy plant. Asked what kind of safeguards should be adopted to make clandestine developments impossible, Mr. Gromyko rejected the permission to make aerial surveys at will and deprecated the value of such surveys "because they will be based merely on information provided by the Governments." At the same time, Mr. Gromyko reiterated the Soviet Union's desire for strict inspection. Asked whether only the officially reported plants will be inspected, or whether some kind of search for clandestine operations will be permitted, Mr. Gromyko merely said that the scope of inspection must be defined in the convention.

CONTROL COMMITTEE RESUMES SESSIONS

April 10: *Control Committee* (Committe 2) met to resume the work interrupted last December.

A working paper was presented by the United States Delegation. It was opposed by the Soviet delegate because it diminished the importance of the question of the prohibition of atomic weapons.

When a vote was taken, ten members voted in favor of the American work plan. No vote of negatives, or abstentions was taken.

The working paper was not made public. According to the newspapers, it suggested "that the Committee devote itself first to outlining the exact functions and mechanism of the international authority." The first job would be the definition of terms, after which the Committee would get into the functions of the organizations in research, mining, processing, stock-

piling of nuclear fuels and the designing of plants and reactors."

More difficult problems, which should be saved for a later stage, include the "principles to govern geographic location of dangerous activities and stockpiles, the finances and budget of the atomic organization and the whole complicated controversial question of prohibitions, enforcement and the veto on violations."

April 14: The *Working Committee* continued plying Mr. Gromyko with questions concerning the Soviet conception of effective inspection. In addition to the scope of inspection envisaged by the Soviet Union, doubt arose as to whether the inspection will be truly international. Mr. Gromyko said that inspection should be under an international authority, and not under national governments (as was suggested in the first Soviet plan), but refused to commit himself as to an international personnel. Mr. Parodi (France) suggested that further questions to Mr. Gromyko be put in writing and Mr. Gromyko agreed to receive them.

DEFINITIONS OF CONTROL

April 16: A second meeting of the *Control Committee* (committee No. 2) started work by an attempt to define the meaning of the words "control", "inspection" and "supervision". (The word "control", in particular, has a different connotation in America and Europe. Americans usually mean by control, actual ownership and management, while Europeans—and Russians in particular—think of supervision or keeping check on activities.) A standing Sub-Committee was appointed to decide on definitions, consisting of Messrs. Nisot, of Belgium; Hsioh-ren Wei, of China; Fernandez, of Colombia; Skobeltsyn, of the Soviet Union; and Fine, of the United States.

April 17: In the *Working Committee*, a new attempt to obtain from Mr. Gromyko a commitment on international inspection personnel ended in failure. A written question was submitted by General McNaughton (Canada), but Mr. Gromyko answered that it was out of order, since it led away from the discussion of the Soviet amendment concerning supervision of existing plants, which is on the agenda. He promised to answer it when the mechanism of inspection comes up for discussion.

Mr. Osborn (U.S.) pointed out that the Soviet Union had had nine months to think these problems over and should have answers ready by now.

The *Control Committee* under the Chairmanship of the British physicist, Professor Sir Charles Darwin, began, on the same day, the discussion of "Operational and Developmental Functions of the International Agency and Its Relation to Planning, Coordination and Direction of Atomic Activities."

The American delegate, Mr. Osborn, made a defense of the American proposal for international management of atomic energy, against Soviet denounciation of it as a "cartel". He said that "we all" disliked monopolies, but in atomic affairs had no other choice. Many nations, including the United States, Britain, Canada and France, already have set up national monopolies. The United States will stick to her national monopoly until a system of international monopoly is set up. The policy of national monopolies, Mr. Osborn said, is a path of national rivalries.

The United States delegation distributed a secret draft paper outlining proposed functions and powers of the atomic authority.

April 21: The *Working Committee* continued the discussion of the Soviet amendment, asking for international supervision of existing plants immediately after the convention is put into effect. Mr. Osborn offered a change calling for control of all atomic energy plants "after the treaty is concluded." The French delegate suggested that the words "as soon as possible" be added, and the Polish delegate asked that "control" be defined by reference to a future agreed definition rather than to the December 30, 1946 report, and Mr. Osborn agreed to both changes.

Mr. Gromyko found—with some justification—that "as soon as possible" was a vague definition. The Chairman announced that further discussion of this amendment will be postponed, perhaps to be taken up in connection with amendment XI, pertaining to stages in the putting of controls into operation.

April 24: In the *Control Committee* Prof. Skobetsyn, the Russian nuclear physicist who served on the Scientific Sub-Committee last year and has now returned from Moscow, answered Mr. Osborn's attack on national monopolies by asserting that the pessimistic American view was unwarranted and that the main danger lies in the anomalous situation of the present exclusive American monopoly. He urged the committee to work for re-establishment of international cooperation between scientists.

RESEARCH FUNCTIONS OF A. D. A.

Most of the session was devoted to discussion of papers presented by the U.S., Australia, Britain, Canada, France and Poland containing suggestions for the research functions of the Atomic Development Authority.

These papers concurred in the opinion that research concerned with the bomb or with radioactive poisons should be prohibited in national laboratories and confined to A.D.A. laboratories.

Sir Charles Darwin suggested that two laboratories might be built in North America, two in Western Europe, one in the U.S.S.R., and one in the southern hemisphere. He suggested for each laboratory a staff of 100 scientists at a salary of $10,000 each, or a total salary budget of $6,000,000. He indicated that research on fuel and power development might have to become an international monopoly and proposed that four such laboratories be located in America, Western Europe, the Soviet Union and the southern hemisphere.

Dr. Ignace Zlotowski of Poland, a nuclear physicist who worked with Curie and Joliot in Paris before the war, pointed out that inquiry into atomic weapons and research involving dangerously large amounts of fissionable materials would have to be undertaken by the international agency. Beyond these limits he urged that encouragement be given to national research. He suggested that the international agency might assign specific problems to certain countries, supplying them with fissionable materials and equipment and even funds, and might serve as a clearing house for the exchange of research results.

E.R.

AN ALTERNATIVE COURSE FOR THE CONTROL OF ATOMIC ENERGY

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cause of the atomic bomb and the airplane, regardless of any governmental structure that we set up or do not set up. It is necessary in this case to take our chances, and I repeat, the price of freedom is vigilance.

But how proceed to secure the adoption of such a program? First, there must be a popular demand for it. Various groups in this country are now striving to inform people along these lines, and with considerable success. The Roper pole of last August showed the following result in answer to the following question:

"If every other country in the world would elect representatives to a world congress and let all problems between countries be decided by this congress, with a strict provision that all countries have to abide by the decisions whether they like them or not, would you be willing to have the United States go along on this?"

Yes	62.8
No	19.8
Don't know	17.8

This is encouraging and certainly does not justify pessimism. With a substantial popular demand, action by the United States government can be secured.

IMMEDIATE ACTION SHOULD BE TAKEN

As to the second step, the United States representative should propose that the United Nations be converted into a real world government, giving all nations the opportunity to accept the proposal. If some nation or nations refuse to go along, then the partial world government should be started anyway, including all countries that are able to agree on the necessary principles and some adequate mechanical structure to implement those principles. I should like to see the principles include an adequate bill of rights for world citizens.

I present these ideas to my fellow scientists, and ask only that they weigh them in terms of the possible alternatives that are available. I believe that it is unrealistic to say that we must secure agreement along the lines that we are at present following. It may not be possible to secure agreement along those lines because we are not able to convince other people that they should be followed, and I believe that we cannot convince the U.S.S.R. at present that these should be followed. If this premise is accepted, then what line of action should be recommended at present? It is my belief that the line of action proposed here is the best of the possible alternatives that have any chance of acceptance by the western democracies in this present situation.

THE WORLD GOVERNMENT MOVEMENT IN THE UNITED STATES

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selves with direct political action. A few brief examples should suffice to indicate the general trend of the efforts:

1. All of the groups have been effective in securing statements from prominent citizens favoring the establishment of a federal world government. An outstanding example along this line is the work of the North Carolina Chapter of World Federalists. That group succeeded in securing statements of approval for world government from groups and individuals such as the American Legion (North Carolina), the State Legislature, and a substantial fraction of the mayors, church leaders, education leaders, and club leaders throughout the state.

2. The Massachusetts Committee for World Federation was largely responsible for placing on their state ballot a resolution favoring world government. This was approved by the public by a vote of nine to one, and recently the resolution was passed by both houses of the Massachusetts Legislature.

3. Americans United for World Government proved itself quite effective as a political action group during its work on such issues as atomic energy legislation and the British Loan.

It seems clear that the world government movement in the United States has now reached the point where real effects can be observed. The leaders of the movement are the first to point out, however, that they have a long way to go before they can consider their task in America complete. But all of them believe that if they succeed in America, they will succeed in the world.

▲ BOOKS ▲

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considerable henceforth. Let us hope that this healthy appetite will continue to be titillated by such delightful repasts.

The book should be useful in adult study groups as well as in popular science classes at the high school and junior college level.

—W. F. Libby

EXPLANING THE ATOM by Selig Hecht. New York: The Viking Press. 1947. 205 pp. Illustrated. $2.75.

Selig Hecht, Professor of Biophysics at Columbia University, has written a popularization of nuclear physics that should be studied closely by all professional popular science writers. It is a beautiful example of popular science at its very best. Furthermore, it is a sound demonstration that the facts of science can be explained to non-scientists in a thoroughly understandable manner, without talking down to the audience or without oversimplifying the subject matter to the point of creating technical inaccuracies. The author should be enthusiastically congratulated.

Professor Hecht develops his subject matter "from the outside in", discussing first the atom as a homogeneous ball, followed by a development of the concept of atomic weights, and the periodic system. From there he proceeds to discuss atomic structure, and the evidence for the existence of the nucleus. He then develops the properties of nuclei, introducing at the same time the concepts of isotopes and neutrons. Uranium fission is then brought in, followed by a brief discussion of the Manhattan Project and atomic bombs.

The author's style is pleasant, and the subject matter should be comprehensible to anyone with a high-school education. The illustrations are appropriate, and in general they are well done.

—H. Brown

A Japanese Scientist Describes Destruction of His Cyclotrons

(Continued from Page 145)

burning of Japanese libraries or the smashing of Japanese printing presses," adding that months of continuous operation by the largest cyclotron the Japanese had would at most produce barely enough atomic bomb material to see, and that "it requires pounds of such material to make one bomb." They concluded that "men who cannot distinguish between the usefulness of a research machine and the military importance of a 16-inch gun have no place in positions of authority." Later, Harvard and Massachusetts Institute of Technology scientists sent letters to Secretary of War Patterson, denouncing the destruction of the Japanese cyclotrons. President Compton of the Massachusetts Institute of Technology urged, in a strongly worded letter to Secretary of War Patterson, immediate dismissal of the officer who gave the order.

It is quite clear that the destruction of the cyclotron produced a considerable discussion among American scientists, and the information given to us by Major O'Hearn that the order for the destruction was given after consulting the opinions of American scientists must be regarded as untrue. According to what was reported by *The Stars and Stripes* and *Nippon Times* there were exchanges of notes between the U. S. Government and GHQ, making it clear that the cyclotrons were destroyed by an order from the War Department. *Nippon Times* printed a San Francisco broadcast stating that Secretary of War Patterson said that the destruction of the Japanese cyclotrons was a case of a mistake in the War Department.

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Dec. 20, 1945

P. S. Secretary of War Patterson later came to Japan and he was reported as having said at a press conference on about January 10, 1946, that he would take the responsibility for the destruction of the cyclotrons in Japan, adding that he did not see the message that was sent out, and that their mistake was that they did not consult with their scientific advisers.

With the Atomic Bomb Casualty Commission in Japan

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are a much commoner response in negroes than in the white population of this country. There are undoubtedly other factors involved in susceptibility. It was found that keloids were also common in Japanese patients who had been burned by flash explosions, as from gasoline vapor, and it is entirely probable that the thermal injury of the bomb is responsible for the keloids rather than exposure to radiation, since they have occurred at considerable distances from the bomb center.

The work of studying after effects of atomic casualties will be a considerable one for various reasons. Among these is the fact that public information on this subject is likely to create undue excitement. For example, an unofficial story which gained newspaper publicity soon after the first bomb stated that nothing would be able to live in the bombed area for 70 years. This story gained much more recognition in Japan where it was received by radio than any of the later accurate information, and when our party was there 1½ years later, it was still creating considerable concern, especially in Nagasaki.

STUDY OF GENETIC EFFECTS

The question of genetic effects of the atomic bomb is one which is likely to become involved in difficulties of this sort, especially in view of the vivid statements by Professor Haldane regarding the possible deterioration of the human race from the emergence of recessive genetic effects. There is certainly no evidence at the present time indicating that abnormal infants have been produced as a result of bomb radiation, yet the lay or pseudo-scientific mind is likely to seize upon a single report of such a birth in a bomb victim (such as occurs in any location, such as Chicago, with known frequency) as evidence of an atomic bomb effect.

A definite attempt is being made to determine the results of all conceptions in the Hiroshima area, organized by the Japanese National Research Council. This is part of a larger enterprise, in which the Hiroshima prefecture has collected histories from no less than 160,000 persons surviving the blast, with data on distance from the hypocenter, position, symptoms (if any) of radiation sickness, and so on.

It is, of course, necessary to set up a control area in which the normal pattern of health can be studied in a similar population, since any changes resulting from the bomb may be expected to be small and could probably not be detected at all without reference to a Japanese population existing under comparable conditions of nutrition and other attritional effects of the war. The city of Kure, 25 miles from Hiroshima, has been tentatively selected for this purpose. Initial steps were taken by holding meetings with the leading physicians and midwives of Kure, presenting them with this possibility. It will require little thought to appreciate the magnitude of such a program.

The results of the long-term study in Japan may be expected to exceed the original necessary objectives. The study of vital statistics alone, if carried out as it must be, may well result in the most useful and extensive vital statistical study which has ever been attempted. Whether or not any genetic effects are detectable, much fundamental information can be gained in human genetic problems. The keloid study promises to be an important contribution to surgery. But larger still, such a study will be an international collaborative effort which, in Dr. Henshaw's words, "affords a most remarkable opportunity for cultivating international relations of the highest type...The fate of Japan lies much more in the hands of America than most Americans realize; moreover, it may also be said, that the fate of America will be determined much more by the establishment of policies in Japan than most Americans realize. Because of the ascendant leadership of science today and because of American position, American science must of necessity accept a large measure of the responsibility for development."

The Senate Debates Mr. Lilienthal's Confirmation

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ant, that we make our record crystal clear, so that it cannot be misunderstood in history. It is necessary for us to rally on our side the opinion of decent men everywhere, not only in our own country, as to the rightness of our proposals and the rightness of our intentions.

"Now Mr. President, suppose there is no agreement reached, what are the horrible alternatives? Mr. Urey, man of peace, wrote an article some time ago in which he said that unless we achieved agreement there was nothing for America to do but to go out and conquer the whole wide world. I pointed out to him then, and I point out to the Senate now, that if America should be compelled to take that course the result would be that we would lose our democracy here at home, because, as some one has pointed out, the regimentation and regulation of this country would be bound to be such as to destroy our civil liberties and our Bill of Rights.

"Then the other alternative has been suggested that we could form an atomic energy authority without Russia or without any disagreeing nation. At first that seems like a possibility, and rather an attractive one, but I think it would probably be rejected because it would be realized that without all great nations within the authority, it would be certainly bad judgment for us to distribute fissionable material, as we would, around the world to make that many more points of contact for the securing of it by stealth and subversive activity.

"I have developed, at least to my own satisfaction, a new definition of aggression. In my opinion—I may be mistaken—any nation which refuses to accept decent, fair, and objectively moral proposals for the control of atomic energy has committed an act of aggression against the rest of the world. It is my opinion that when a nation has refused to enter into such an agreement, given a certain period of time, which I believe to be from 3 to 6 years, no sensible person in the United States will go to bed at night knowing that he will get up in the morning, and no sensible man will get up in the morning knowing that he is going to go to bed at night. If that is the kind of world that those who condemn this proposal want to live in, I say that I want no part of it for myself or those who are near and dear to me."

E.R.

How the American People Feel about the Atomic Bomb

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working order), and an almost equal proportion read daily newspapers. More than half said they read magazines—mostly the monthly digest magazines and the weeklies containing fiction and miscellaneous articles. About a tenth read news magazines, and about twice as many the newspicture magazines. Magazines devoted to more extended discussion of public affairs were read by only a small percentage. All these figures, derived from the respondents' statements, check closely with other sources of such data for the population as a whole.

About 1 person in 14 had available none of the popular media of information—had no radio, read no paper or magazine. Many, of course, had all three sources at hand.

Less than 4 people in 10 said they listen to radio programs dealing with world affairs. Even among people with college education, only 6 in 10 reported listening to any such programs. Among the most poorly educated, the incidence of listening was very low.

Generally speaking, people reported having learned something about the bomb from whichever of the media they reported having. A very large majority had read something about it in the papers and heard about it on the radio. Almost half had read about it in magazines. Only a third, however, remembered seeing any movies or newsreels of the bomb; among these people, movies ranked quite high as the medium that had given them "the best idea of how destructive the atomic bomb is," but very low as the medium from which they had obtained most of their information. Less than one percent said they had obtained most of their information about the bomb from books.

It is of interest that the people who had had information about the bomb from both radio and newspapers tended to name radio as the more trustworthy source. Those to whom magazines were also available named magazines most frequently as the most trustworthy. The tendency to favor radio over newspapers was particularly pronounced among the less educated people; among the better educated, preferences were more equally divided between the two media.

War Department Thinking on the Atomic Bomb

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decision by itself (and the certainty that it can has yet to be demonstrated), conventional military operations will continue to be employed, using, for some time to come, substantially the tactics of the end of World War II, characterized by constantly increasing speed of movement and more concentrated power. The principle of dispersion to limit the effects of Air action will be of greater consequence. Massing of forces can be effected only with full realization of the risks involved in offering a profitable target for the employment of the atomic bomb. Of necessity, since offensive action requires some concentration of forces, tactics will have to evolve methods of quickly massing for offensive action, then quickly dispersing. This necessity for dispersion applies to all components of the Military Establishment, Land, Sea, and Air forces.

A new weapon, even one of such revolutionary character as the atomic bomb, serves not to make war "cheaper," but only to add to the burden borne by all peoples and all nations in the interest of National Security. The development of the atomic bomb, even temporary monopoly of its employment, has not given the U. S. an inexpensive substitute for a balanced Military establishment. The bomb, and the potential range of aircraft and missiles, has made the defense of the nation more difficult, more expensive, and less certain of attainment. The need of eliminating war itself has never been so vitally necessary to the National Security of the U. S. and to the survival of civilization throughout the world.